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Sir William Burnett K.C.B. K.C.H. M.D. F.R.S. &c. &c.
The Late Medical Director General of the Navy.

Journal
of the
Royal Naval Medical Service.

Original Articles.

SIR WILLIAM BURNETT, K.C.B., K.C.H., M.D., F.R.S., F.R.C.P., THE FIRST MEDICAL DIRECTOR-GENERAL OF THE ROYAL NAVY.

By Sir HUMPHRY ROLLESTON, K.C.B., M.D., D.C.L.
Fellow of the Royal College of Physicians, President of the Section of Historical Medicine of the International Medical Congress, London.

By an irony of fate the names of not a few eminent men are kept in familiar remembrance more by some comparatively trivial act or circumstance than by their lives with. Instances of such almost accidental fame of fame readily occur to the mind: for example Baillie's pill, Stoker Wells's forceps, Lawson Tait's hot goes limetus and Sir William Burnett's disinfecting fluid. Sir William Burnett's labours for the medical department of the Navy before and during his unrivalled tenure of office at the head of this department of which he was the first Medical Director-General, marked him out as one of the prominent men in its history. He was not like his well known countrymen and rivals in the Service—Lind, Blane and Trotter—a medical writer of note for his contributions to medical literature were mainly official reports, but he was an able administrator and his record and portrait show that he must have been a personality with a handsome, tall and impressive figure.

Like his famous contemporary Sir James McGrigor (b. 1771-1858) who was Director-General of the Army Medical Department for thirty-six years (1816-1851) he was a Scotsman; he was born at Montrose on

[1] Probably more generally known as Addison's anæmia, pill. Matthew Baillie (1761-1823) originated the well known tribute to the great surgeon, Percivall Pott, and was equally well known as the man who tied the aorta of George IV. Addison called the pill, however, after his own name.

[illegible] the son of W[illegible] Burnett [illegible] Ann [illegible] the [illegible] he [illegible] assistant [illegible] Sir John Jervis (afterwards [illegible] St Vincent (17[illegible]) [illegible] at the [illegible] that he was [illegible] graphical [illegible] Queen Victoria [illegible] 1800 [illegible] passing [illegible] the Board [illegible] In 1804 [illegible] 1810 [illegible] medical [illegible] as surgeon to [illegible] obtaining [illegible] His [illegible] Mr [illegible] Mediterranean [illegible] hospitals [illegible] the [illegible] On [illegible] arrival [illegible] the fever [illegible] of the [illegible] fever [illegible] called the [illegible] ships and hospitals [illegible] the Mediterranean [illegible] Facts and Observations [illegible] the Causes, Symptoms and Treatment of [illegible] the [illegible] 1811, 1812, 1813 and [illegible] His Majesty's Fleet in that [illegible] Robert [illegible] Viscount Melville [illegible] This [illegible] embodying [illegible] in 1816 [illegible] from 200 to [illegible] slightly [illegible] and the appointment [illegible] A Practical Account of the Mediterranean [illegible] appeared in [illegible] hospitals of His Majesty's [illegible] with Cases [illegible] Symptoms and [illegible] History of

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[illegible] the [illegible] William [illegible] the [illegible] the [illegible] him

[illegible] in 1810 1811 [illegible]

[illegible] to England [illegible] Russian Fleet, but in March 1811 he [illegible] influential [illegible] the appointment of physician to the Russian Fleet [illegible] to Cronstadt [illegible] his appointment status but [illegible] Meanwhile an outbreak of [illegible] fever in the ships. While [illegible] the care of the prisoners of war at Chatham [illegible] and American [illegible] were in the throes of a typhus [illegible] fifteen patients in the hospital ship had gangrene [illegible] had already died and two others were [illegible] smallpox [illegible] and the [illegible] but there was deep snow and the prisoners [illegible] Burnett went about his duties quite [illegible] to the [illegible] infection and personal influence and soon brought [illegible] greatly improved state of affairs as is shown by the record that [illegible] out of 193 patients before his arrival 54 or 28 per cent died [illegible] 118 patients admitted while he was in charge 61, or 12 per cent [illegible] succumbed. An account of the Contagious Fever among the Prisoners of War at Chatham was published by him in 1831. In the middle of 1811 he accompanied the Russian Fleet with a strength of 20 000 men to Cronstadt and on August 4 was received with the utmost attention by the Czar who wished to confer on him an Order of knighthood and on Burnett's declining this in accordance with the regulations wrote specially to the Prince Regent on his behalf and presented him with a diamond ring. On his return Burnett was placed on half pay but after waiting nearly two years for an appointment and finding an idle life uncongenial he settled in practice at Chichester becoming physician to the general dispensary there and to quote from an *intra vitam* biography[1] "very soon acquired a more extensive practice in that city and neighbourhood than any physician had ever had before him."

In 1822 he was recalled to the Medical Department of the Navy receiving on January 28 a letter from Mr W Huskisson the Treasurer of the Navy with an entirely unsolicited offer from Lord Melville the First Lord of the Admiralty (1811 1827) of a Medical Commissionership on the Victualling Board, on which the Medical Commissioners had sat since 1817. This appointment necessitated some pecuniary sacrifice, but Burnett eventually accepted it though with some misgivings as to his freedom of action. His senior colleague Dr John Weir, does not appear to have been a forcible character in fact some years later an anonymous correspondent in the *Lancet*[2] evidently a naval surgeon dismissed him in the outspoken fashion of the day as "that mixture of ignorance and eccentricity." Burnett's appointment as Medical Commissioner at once

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[1] *Lancet* 1850 ii p 198. [2] *Lancet* 1880 ii p 703.

[illegible] changes in the Naval Medical Service (*vide* p 5) and [illegible] that his influence dominated his senior colleague [illegible] Wood In this respect history repeats itself for in 1795 [illegible] Sir Gilbert Blane was appointed 1st Commissioner of the [illegible] Sick and Wounded, and at once Lind's recommendations [illegible] prevention and cure of scurvy made forty years previously [illegible] fully enforced with the result that scurvy was banished [illegible] Royal Navy Dr Wood retired after twenty nine years service on [illegible] pension of £583 6s 8d and Burnett was thus left as the only Medical Commissioner on the Victualling Board In connection with his Wood's service it may be noted that a hundred years ago and well into the [illegible] forties, medical occupants sat long in the seats of the mighty Sir James McGrigor was Director-General of the Medical Department of the Army for thirty six years (1815-1851) and Sir Henry Halford [illegible] the [illegible] physician of 'the intercepted Letters' in the *Times* of 1841 was President of the Royal College of Physicians for the [illegible] forty years (1820 1844) The example set by Dr John Sims who was President of the Medical Society of London for [illegible] twenty years (1786-1809) was not entirely propitious for it led to the formation of an opposition society—the Medical and Chirurgical Society [illegible] in 1805 became the Royal Society of Medicine—by those who did not approve of his rule In his capacity as head of the Medical Department [illegible] had been different titles in succession Starting as sole Medical Commissioner he was on June 9 1832 made Physician General of the Navy—an office established by 2 Will IV Cap 40 and nine years later [illegible] was altered to Inspector General of Naval Hospitals and Fleets Burnett's appointment being dated January 28 1841 finally on January 1, 1841 the designation Director-General of the Medical Department of the Navy was introduced

Burnett retired in March, 1850 at the age of 76 with a special superannuation allowance of £1 000 a year in consideration of his services and was succeeded by Sir John Liddell, who was 61 years of age and occupied the chair for nine years Sir John Richardson undoubtedly the most eminent man in the Naval Medical Service made an application in the usual terms to the First Lord of the Admiralty but after some delay was refused on the ground of advanced years (67) the contemporary medical press[1] remarked that his known independence and dislike to work in chains caused his name to be set aside by the Government' Sir William Burnett died from old age in his 82nd year on February 16 1861 at Lost Pallant House Chichester and was buried at Boxgrove, Sussex where a memorial window to him and his wife (1781 1859) was put up by his son in 1865 He left one son, William, who was successively

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[1] *Brit Med Jour* 1856 p 420

[illegible] Fairmore and Boxgrove, Sussex [illegible] His marriage with Maria [illegible] Baker took place in 1807. He left [illegible] heavy losses from Russian investment [illegible] of the Crimean War.

Burnett's prominent position in the medical [illegible] a fair share of honours. He was [illegible] physician in ordinary to William IV [illegible] Queen Victoria and been appointed physician [illegible] 1837 to April 13, 1881, and some [illegible] Hanoverian Guelphic Order, as thereby [illegible] Knight Commander of the Bath (Military [illegible] elected a Fellow of the Royal Society in April 18[illegible] Honorary Fellow of the Imperial Medical [illegible] Edinburgh. At the Royal College of Physicians [illegible] a Licentiate in 1825, a Fellow in 1830 and Censor [illegible] 1845, 1846 and 1847. He was M.D. Aberdeen and LL.D. [illegible] of Surgeons of Ireland and of Edinburgh. He [illegible] the Medical Register (first published in 1847) [illegible] Medical Directory (started in 1845) which shows that in the [illegible] London life his address was 43 Wimpole Street [illegible] which Miss A. M. Burnett has kindly [illegible] then had a considerable private practice [illegible]

Besides Sir Martin A. Shee's portrait which is in the [illegible] grandson W. G. Burnett of Pulborough there is a crayon [illegible] done in 1840 by Mayall of West Strand accompanying his [illegible] the *Lancet* 1860 ii 518, 563 and a photography by E. Bridgeman A.R.H.A. in the *Professional Scientific and Literary Portrait Gallery*.

Services to the Medical Department

Directly after his appointment as Medical Commissioner to the Navy, evidences of Burnett's activities became [illegible] Being stationed by the inadequacy of the returns made at the [illegible] of hours in the Naval Medical Establishments he directed the medical officers of all hospitals and ships afloat to send in periodical returns on the lines of his, so prepared nosologically. In this same year, 1842, he [illegible] the libraries and museums at the two great Naval Hospitals, Haslar and Plymouth; the Haslar museum was subsequently enriched by him and to a greater extent by Sir John Richardson, the Arctic explorer, who was in medical charge there from 1848 to 1855. Impressed with the unsatisfactory conditions at Chatham in 1841 he urged that a hospital on land should be erected to take the place of the hospital ship. By [illegible] 1850 [illegible] had received the sick and a medical and it was largely [illegible] that the Melville Hospital was erected and opened in 1858. His influence was

exert [illegible] the sleeth of [illegible] Naval Surgeons.

[illegible] assistant [illegible] most [illegible] 1860 [illegible] correspondence in the *Lancet* [illegible] of the medical officers at Haslar [illegible] of presenting Burnett with a [illegible] of the *Lancet*—the leaders [illegible] Wakley [illegible] stigmatized it as a dirty on [illegible] empty [illegible] and assistant surgeons [illegible] Naval medical officers as [illegible] compulsory [illegible] and [illegible] Burnett had ever [illegible] [illegible] The correspondents [illegible] sentiment [illegible] maintained the cloak of anonymity [illegible] Haslar memorialists [illegible] Dr. Scott, Curator of the Museum [illegible] named their names and said that Burnett tried to suppress the [illegible] testimonial before the [illegible] discussion arose in the pages [illegible] *Lancet*. The opponents [illegible] have been merely the malcontents [illegible] always exist and whatever the fate of the testimonial which [illegible] have been abortive there is no doubt that in 1841 ten years [illegible] Naval medical officers presented him with a full-length portrait of [illegible] by Sir Martin Archer Shee, President of the Royal Academy [illegible] by Henry Cousins in 1841 and a service of plate in recognition [illegible] he had rendered not only to their department but to the [illegible] This [illegible] after [illegible] had pleaded their cause before [illegible] for improving Naval and Military promotion and [illegible] with the Chairmanship of the Duke of Wellington. In his [illegible] (p. 181) published in 1840 he insisted on the very [illegible] framing medical officers and gave a table showing the [illegible] since 1815 from which it dates the numerical surgeons [illegible] 100 and of assistant surgeons from 128 to 341. [illegible] Naval Surgeons not other than and put forward [illegible] the Admiralty of the day had little sympathy with [illegible] of his representations. [illegible] were delayed [illegible] their with masters, paymasters (purser). Naval [illegible] transmuted from Warrant into Commission [illegible] appear to be no doubt that [illegible] the success [illegible] struggle of the assistant surgeons of the Navy [illegible] to the continuous support of their chiefs

[illegible] contributor [illegible] translation [illegible] October [illegible] 1881.

[illegible] Sir William Burnett [illegible] in Malta [illegible] 1810 1813 (*ed* p 2) appears [illegible] as [illegible] fever [illegible] often [illegible] as the [illegible] and Colonel Lane Nutter [illegible] published [illegible] *Malta* an infection of the Mediterranean Malta or [illegible] times which was first accurately described by [illegible] It is of course possible that examples of fever due [illegible] have been mixed up with those observed by [illegible] hospital in America Burnett also [illegible] seen [illegible] existing that it must be certain [illegible] previously pointed out in 1812 [illegible] interesting [illegible] that [illegible] of Malta after [illegible] was [illegible] of course tend to lessen the number [illegible] [illegible] was [illegible] the question [illegible] in his second [illegible] with Sir William [illegible] in his published [illegible] Observations [illegible] yellow fever [illegible]

[illegible] Medical [illegible] 1848

[illegible] Medical [illegible] 1848

[illegible] 1810 [illegible]

[illegible] hugely instituted quarantine [illegible] Fever in H.M.S. *Bann* in the [illegible] Mauritius in the Island of Ascension in 1850. [illegible] by Hutch as a description [illegible] Contagious Fever among the Prisoners of War [illegible] published until 1851. In 1851 the [illegible] in the Fleet in [illegible] Medical Journal [illegible] pages of the *Medical Times* [illegible] 10–130). His name also appears at the foot of page [illegible] Principal Diseases [illegible] Abyssinian Station [illegible] in the office of the Director General of the Medical [illegible] in compliance with the directions [illegible] Lords Commissioners of the Admiralty [illegible] Sir William Burnett, M.D., K.C.H., [illegible] M.D., Surgeon K.N., London, 1847, pp. 20[illegible]. [illegible] Memorial addressed to [illegible] First Lord of the Admiralty, [illegible] 10th December. The [illegible] was the result of Sir D. Lyons's speech in the House of Commons on June 21 [illegible] evening. The claims of medical officers of the Navy and Army, especially the civilians, particular mention being made of Mr. James Coulson of the Westminster Hospital, who was twice [illegible] in the Transnubian Campaign [illegible] military services and [illegible] Sir D. Lyons practically confined his allegations to the Army, [illegible] Sir J. M. Burrell and Captain Fitzhall briefly stated up in the interests of the Navy. From the Memorial much of what was [illegible] specially incorporated in Sir William Burnett's Reply in the *Times* of 8 [illegible] it appears that he was able to effect a saving [illegible] at the same time increasing the comforts and efficiency of the Naval Medical Department.[2]

Burnett's Investigations and Discoveries in Fluids

Sir William Burnett's most important [illegible] the preservation of timber, numerous [illegible] by the [illegible] moth and beetle. [illegible] in 1845 the preservation of wood [illegible] Hesketh [illegible] Burnettized [illegible] chloride of zinc. The [illegible] also patented

[illegible] Army in the [illegible] Lieutenant Sir Harry [illegible] Medical [illegible] the [illegible] Smith in [illegible]

[illegible] 1851, Dec. 8, p. 630. [illegible] Medical [illegible] of the [illegible] I am [illegible] Medical Officer of Health [illegible] Medical [illegible]

[illegible] and [illegible] specific gravity [illegible] with a gallon of water.

[illegible] with the title [illegible] of zinc (Sir Wilson [illegible] in-[illegible] [illegible] gentlemanly [illegible] in application [illegible] hospital [illegible] purposes [illegible] Medical W[illegible] Medical Hospital Burnett [illegible] in Naval [illegible] at the Imperial [illegible] Medical Director General [illegible] M.B.E. [illegible] for the following [illegible] Service. Allout Scale [illegible] hospitals it gained [illegible] place [illegible] month when [illegible] was in its turn [illegible] of potassium. [illegible] was for a time [illegible] for [illegible] that would not [illegible] industrial purposes [illegible] found to be satisfa[illegible] 1920 a modified [illegible] some magnesium [illegible] adopted.

That a prominent [illegible] patentee on a large scale [illegible] the profession to [illegible] respect to which his [illegible]

It is natural [illegible] senior the other junior [illegible] six years (1819–1851) [illegible] much the longest [illegible] military service especially with the [illegible] Campaign. They were both [illegible] department after a great war and yet [illegible] departments. As soon as he became [illegible] inaugurated the system of medical reports and [illegible] anticipating, Burnett, and [illegible] and pathological anatomy and the [illegible] at Pitt Club [illegible] afterwards transferred to Netley and [illegible] at Millbank. These two Scottish Directors of the Medical Service [illegible] A.C.B. from Queen

[illegible]

[illegible] HEALTH [illegible] AND THE [illegible] WAR

By [illegible]

[illegible]

[illegible] Portsmouth [illegible]

[illegible] may be a valuable [illegible]

[illegible]

[illegible] venture to add [illegible] of very [illegible] points in between all [illegible] Civil, Naval, Military [illegible] with a view to [illegible] Naval and Military [illegible] the Army [illegible]

[illegible] and [illegible] in this [illegible]

We [illegible] to meet the [illegible] Army [illegible] the Army [illegible]

[illegible]

(1) A [illegible] that the [illegible] exercises [illegible] entire [illegible] discussion [illegible] executive [illegible]

(2) [illegible] now always [illegible] naval medical [illegible] in this [illegible] called Naval Health [illegible] manifestos in Chief [illegible] population, to investigate [illegible] medical officers of the [illegible] mind measures to prevent [illegible]

I hope you will publish [illegible] portance of this work, quoting [illegible] ment of Naval Health Officers [illegible]

mand [illegible] Hampshire [illegible] West Sussex the Isle of Wight and the Channel Islands the [illegible] can be summed up as those of the County Medical Officer Medical Officer of Port Sanitary Authority and Military Special Sanitary Officer [illegible] because it includes the co-ordination of an municipal [illegible]

I would [illegible] the co-operation which has been built up between the Civil and Military Medical Officers of Health in the Eastern Command [illegible] has greatly assisted me in forming the [illegible] of naval health control In every case [illegible] it was promptly given The chain of [illegible] such that although six limited outbreaks of [illegible] Eastern Command during the years 191[illegible] and 1920 only [illegible] among the naval population, which was contracted in [illegible] Hilfers crew homeward bound and was limited to [illegible]

A [illegible] improvement is taking place in naval hygiene, [illegible] living and working spaces in ships the temperature [illegible] maintained between 60° and 62° F in cold [illegible] and lighting in ships barracks and offices [illegible] classes of ships proceeding on foreign [illegible] proof traversing electric fans are [illegible] health and comfort be fitted Much yet [illegible] for the health of man in the Royal and Mercantile Navies

[illegible] Within the [illegible] the matter up in a most energetic and [illegible] Directorates of Hygiene and [illegible]

[illegible] is to collect all information that [illegible] health and welfare of the Army and thereby [illegible] such measures it is hoped that the [illegible] cost to the [illegible] expenditure on transport hospital treatment, [illegible] and pensions from the minors sick list may be greatly reduced [illegible]

Military Schools of Hygiene [illegible] have been established at Netley for the Southern Command at [illegible] in Northern Command and at Carrickfergus for the Irish Command At these schools officers and a certain [illegible] of N C O s and [illegible] of all branches of the Army are to [illegible] practical instruction extending over three weeks in [illegible] camp sanitation and prevention of disease

It [illegible] to see what a [illegible] such information must have [illegible] and reversions in the days to come

[illegible] has [illegible] a campaign against venereal diseases that [illegible] and is worthy of attention

[illegible] the Society of Medical Officers of Health is a [illegible] Naval Military and Air Force Hygiene Group [illegible] which is giving this subject their close [illegible] it is hoped that the Society may help to make it an

[illegible]

[illegible] Kent [illegible]

[illegible]

[illegible]

[

(*e*) *Water Supplies*—Not only those already in existence but those projected and all the sources to be noted

(*f*) *Drainage and Conservancy Arrangements*

(*g*) *Latrines*—Where dismantling of men and children and the supply that can be done is time and capacity

(*f*) Accommodation available for reception and treatment of infectious diseases and contacts when considered number to be in view of transport &c.

(*g*) *Laboratories*—where quick and prompt but not elaborate examinations can be carried out

(*h*) *Hospitals*—in which and arrangements made whereby the [illegible] can be made of them

In obtaining such information the help of the local Medical Officer of Health would be invaluable and an organization would be formidable whereby headquarters staff in any civil and military [illegible] in peace manœuvres would be not merely advisory but [illegible] officers in matters relating to the maintenance of the health of the army in any country

After the Cholera Sanitary Service [illegible] the attainment of the desired co-operation viz —

(*a*) The reciprocal [illegible] and mutual assistance for health purposes [illegible]

(*b*) Notification of [illegible] important factor to apply not only locally [illegible] but [illegible] country but even in time of war—and [illegible] where [illegible] pressing on have &c.

(*c*) What strikes us should be a fair [illegible] that special precautions must always be taken [illegible] the fighting forces are concerned as they are particularly [illegible] are fooling to small in [illegible] short [illegible] and [illegible] given through any lack of [illegible] the [illegible]—than for pill

(*d*) Communicable diseases should be notified including measles and [illegible] in all [illegible]

(*e*) Diseases such as [illegible] should be published [illegible] milk and milk [illegible] [illegible] the general public in that [illegible]

(*f*) Bulletins and all [illegible]

(*g*) Compulsory [illegible]

(*h*) The prevalence and [illegible] of venereal disease

(*i*) That bacteriological examination may be made available in as many local centres as practicable to eliminate or at least reduce likely [illegible] through the post

(*j*) All disinfecting plant, irrespective of authority and situation be available whenever necessary

I was much struck by the condition of the personnel when conscripted [illegible] Africa the lack of cleanliness the extremely unhealthy condition of their gums and teeth and the fact that nearly everyone had some

[illegible] the times when [illegible] taken into [illegible] sideration [illegible] campaign [illegible] too strong [illegible] present [illegible] rate [illegible] increase in salaries and wages and [illegible] cost of food [illegible] and material has alarmed [illegible] all [illegible] us to go forward warily [illegible] until more prosperous times follow.

In my [illegible] I have now [illegible] is the increase in population [illegible] when we consider the number [illegible] in 1801— [illegible] hundred [illegible] twenty-[illegible] this year [illegible] just under [illegible] years [illegible] the danger of the ever increasing [illegible] supply has [illegible] and [illegible] is more small measure [illegible] lower ebb than [illegible]

There are two [illegible] and venereal [illegible] then prevent me—[illegible] in this country where so many [illegible] but the disease has not so much in the [illegible] itself but [illegible] recognized in time, and nipped [illegible] excellent when limited outbreaks [illegible] smallpox [illegible] expense must follow in stamping [illegible] prompt measures are alone to be [illegible] that the young [illegible] those [illegible] continue to be unvaccinated [illegible] contract and prevent them spreading.

Many complaints [illegible] having been caused by venereal disease, which we [illegible] thought [illegible] of different origin therefore we may [illegible] that if [illegible] material improvement in the health of the nation would follow.

We, as doctors should attack venereal diseases as infectious diseases are dealt with and prevent [illegible] the religious [illegible] to the clergy, irrespective [illegible] individual and personal [illegible] views.

There is a great hope in the [illegible] to come if the existence of an Empire is threatened, as occurred well in recent memory that by improved organization of the whole forces of research [illegible] the Civil and Armed Forces will have the benefit of the highest medical skill and the latest medical scientific [illegible]

It is in this way that sanitary [illegible] and preventive medicine may become active forces in the preservation of individual lives for those called upon to uphold the defence of our country [illegible] at home and at sea.

Naval Medical History of the War.

[illegible] SHOCK (*continued*) (iii) IMMEDIATE SURGERY WITH THE ROYAL MARINE ARTILLERY HOWITZER BRIGADE IN FRANCE 1916-1918.

By [illegible] Commander E. L. Atkinson D.S.O. A.M. R.N.

The following article is based on the experiences gained during a period [illegible] from May, 1916 to June, 1918.

During the Somme offensive in 1916 the majority of the guns of the Royal Marine Artillery were attached to the III, IV and V armies. In the spring offensive of Arras in 1917 they were with the I and III armies [illegible] in 1917 at the first battle of Ypres they were attached to the V and II armies.

In all between three and four thousand wounded came under observation and treatment. Of these wounded the Royal Marine Artillery Howitzer Brigade contributed between three and four hundred cases, the remainder being from the various units around having no medical officers attached.

General Arrangements and Preparation.

The dressing station in 1916 was a dugout 20 ft. by 9 ft. excavated from a bank, the upper portion being of loose earth and the lower of fairly solid chalk. Its distance from the front line was roughly 3,600 yards. Overhead support was maintained by cross beams and side props. Inside there was room for five stretcher cases and a crosswise table for dressings and examinations. Nearby there was a fairly perpendicular bank which was sheltered to men who had received attention. Lighting was arranged by a very useful small acetylene lamp supplied with the army field pannier supplemented when necessary by three hurricane lamps burning oil and also by candles. Heating was secured by a stove made from a 10 gallon paraffin drum with a stove pipe of Bath Oliver biscuit tins. In case of gas attack the entrance to the dressing station was fitted with double curtains of blankets soaked in a saturated solution of hyposulphite of soda, the outer curtain falling on an outward slanting frame. Anyone entering during a gas attack used the Vermorace sprayer before lifting the inner curtain, in this thus ensured taking no gas with him into the station. The operating table was made of plain deal boards. A smaller table was kept alongside for instruments, dressings and antiseptics. The instruments were those contained in the army field pannier supplemented by two cases of pocket instruments. In addition three first aid haversacks were obtained and were of service when attending wounded before coming to the station. From experience it was found advantageous to substitute shell dressings for the

[illegible] impressed dressings and bandages [illegible] in extra tourniquet Some [illegible] Two gallon Primus stoves ensured [illegible] Supplies of water were stored [illegible] before use to abolish the taste of [illegible] kept in two large enamel dri[illegible] Some large bottles with a small [illegible] under the table Spare dressings [illegible] in sleeves Two large tins [illegible] possible and used in emergency [illegible] kept sterilized in the small metal [illegible] sulphate or tartrate [illegible] with rubber caps In the [illegible] comforts bowl cup soap [illegible] nearest ambulance station A large supply [illegible] provided for cases of gas poisoning

A field telephone to the [illegible] it was connected eventually [illegible]

A bicycle stretcher [illegible] insured rapid removal of wounded [illegible] lessened labour It proved useful [illegible]

A full description of this station [illegible] protracted battle such as the S[illegible] and Ypres and in the retreat in 1918 [illegible] with German pill boxes came [illegible]

In an advance or retreat one [illegible] dressings and upon the contents [illegible] carried in a field cart or [illegible] from an advanced dressing, but [illegible] leaves were provided for [illegible] treatment and [illegible] of any chemical [illegible] serum a sufficient [illegible] least two good blankets should [illegible] and blankets were exchanged [illegible]

Long Liston splints and [illegible] stretched Other splints were [illegible] boarding obtained from [illegible] very useful for gunshot wounds [illegible] parts held together with steel wire [illegible] provision in an advanced dressing [illegible] for high [illegible] Stretchers [illegible]

A convenient latrine is [illegible] and a urinal can be prepared [illegible] utes a hole lined with lamps [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] position with the [illegible] horizontal. In [illegible] of plate 10 mm. [illegible] flanged limiting [illegible] pressures were [illegible] experimentally [illegible] emphasize again [illegible] injection. In [illegible] station to [illegible] and Apiesl's [illegible]

In the [illegible] —especially [illegible]

Hemisphere.—[illegible] of the projectile. The [illegible] earth [illegible] explosive [illegible] fragmentation [illegible] such as a [illegible] smaller [illegible] in fact the [illegible] comparatively [illegible] that [illegible] chamber [illegible] finally ceasing [illegible] explosion [illegible] impact. The [illegible] greatly in size and

[illegible] more serious hæmorrhage. As [illegible] was sometimes exceedingly difficult [illegible] and a limb had been traversed [illegible] when men were thought [illegible] them wounded.

In [illegible] and hæmostatic wadding [illegible] in sterile saline and a hæmostatic bandage [illegible] assists. In a few cases when the [illegible] no attempt was made at this [illegible] the vessel. When the hæmorrhage [illegible] the patient was evacuated as [illegible] I am sure this is the wisest [illegible] hæmorrhage is likely to [illegible] special note is attached [illegible] orderly told to report on [illegible] it was possible only in [illegible] bleeding as far as possible [illegible] The greatest help in [illegible] morphia hypodermically [illegible] Styptics proved useless.

[illegible] was morphia hypo[illegible] of chloroform after a [illegible] to fractures of limbs. [illegible] is useful when the patient is awaiting transport.

Early Wound Treatment.—[illegible] away from the wounded part. The wound [illegible] gauze soaked in hyper[illegible] saline (4 per cent). [illegible] and dressed with wads soaked in petrol. This was the [illegible] way of removing all the ingrained dirt. The [illegible] swabs [illegible] skin was painted with picric acid. The painted [illegible] solution also [illegible] wound is serious [illegible] antiseptic [illegible] After the removal [illegible] was thoroughly cleansed with [illegible] 1000 hydrarg. perchlor. [illegible] saline and packed [illegible] with saline gauze. The [illegible] method were very [illegible] The stay in hospital was [illegible] considerable period.

[illegible] of dislocations and [illegible] under mild anæsthesia [illegible] especially when the [illegible] may be transported a [illegible] With the [illegible] enemy guns [illegible] by stations had [illegible] lengthening [illegible] was never [illegible] wounds but a limb [illegible] gauze soaked in this [illegible] was a useful addition. The other [illegible] The most portable

and therefore the [illegible] generally [illegible]
and tablets of perchloride of mercury

[illegible] Wounds

Cranial Wounds.—The [illegible] cases were [illegible] collapsed condition and [illegible] severely [illegible] from embarrassed respiration [illegible] efforts were [illegible] formed the tongue and [illegible] necessary [illegible] strapping to the cheek [illegible] the sound side and propped [illegible] were profound 40 mm [illegible] and the skin was [illegible] cerebral matter the wound was [illegible] bone fragments removed [illegible] meningeal artery was [illegible] blood were [illegible] trocar and cannula with relief [illegible] symptoms [illegible] to immediate necessities the wounds were dressed with [illegible] and protective When there was respiratory embarrassment the [illegible] lance only was instituted [illegible] the patient in the prone position and [illegible] the mouth and [illegible] time to time Morphia and hyoscine hydrobromide were [illegible] especially in cases of [illegible] irritation Morphia was [illegible] respiration was [illegible] The main effort in cases of [illegible] is the prevention of [illegible] this the lightly wounded and [illegible] assisted

Thorax [illegible] A [illegible] large intrapleural hemorrhage produces profound [illegible] and this [illegible] limited complicated by the [illegible] of large quantities of blood or [illegible] small fragments of shell or bone [illegible] saw an immediate [illegible] hemorrhage [illegible] The immediate [illegible] and cessation of [illegible] [illegible] impossible under [illegible] in the field Apparently [illegible] of the lung [illegible] follows [illegible] puncture for the [illegible] and [illegible] In light cases uncomplicated [illegible] large [illegible] tracheal, immediate hypodermic injection [illegible] conditions most favourable to the patient [illegible] the return to [illegible] slowed the mind is dulled [illegible] of [illegible] submit to surgical attention

Aspiration of a hemothorax—[illegible]—was adopted later in cases where the fluid reached [illegible] Its practice then produced [illegible] and hemorrhage In the [illegible] in passages channeled as [illegible] possible [illegible] the patient [illegible] wounded side to allow the [illegible] the rest [illegible] Where respiration is acutely embarrassed the [illegible] means of the strap used to carry the stretcher [illegible] and embracing the arms

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] pieces [illegible] still [illegible] [illegible] [illegible]

[illegible] supposed to [illegible] in the [illegible] that [illegible] worn

In the rear batteries [illegible] shifters and [illegible] by [illegible] flaged gun positions. Here no very active [illegible] were necessary due to the distance behind [illegible] dugouts were built up near each position [illegible] bomb splinters. Here no digging in was [illegible] numerous canals which in winter [illegible] to lesser extent according to the rainfall [illegible]

The work of the siege guns in Flanders [illegible] each battery having for its objective [illegible] coastal batteries such as Lepnitz (from [illegible] 14 in naval gun which frequently shelled [illegible] eight miles) Jacolmessen (14 in naval) [illegible] (14 in naval) the 11 in Skipe howitzer and [illegible] batteries (Gecthe Breslau Antwerpen [illegible] and howitzer batteries. There were also [illegible] enemy headquarters, and camps and [illegible] objective the bridges in Nieuport [illegible] the Lys.

The activity on the southern sector [illegible] ordinary counter battery work which [illegible]

Notable periods of great activity [illegible] big German advance on March 21 [illegible] whole Western Front was very quiet [illegible] the enemy was suddenly [illegible] again during and after the Ostend and Zeebrugge [illegible] in conjunct with the monitors [illegible] along the coast. It may be [illegible] that [illegible] reason for the [illegible] the siege guns [illegible]

With regard to the medical [illegible] following other headings —

(1) Preparations to meet casualties
(2) The immediate treatment
(3) Their disposal

As this particular unit was stationary the [illegible] very much more simplified as compared [illegible] Infantry or Field Artillery. On this sector [illegible] up to late hospital much more [illegible] any casualty clearing station with [illegible] attain. This was the Belgian Hospital [illegible] (Ocean) which was only six miles behind [illegible] about twenty minutes by ambulance car. [illegible] in all our casualties and supplied a [illegible] station casualty clearing station and [illegible] until such time as the wounded were [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Iodine [illegible]	10	Suture needles with needles—	
Pocket case [illegible]		(horsehair)	[illegible]
Picric acid [illegible]	1	(silk)	[illegible]
Scissors	1 pair	(catgut)	[illegible]
Spunge [illegible]		Tourniquet	[illegible]
stonull [illegible]		[illegible]	½ oz cap
poden [illegible]	1 oz		10
Safety p[illegible]	[illegible]	[illegible]	

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] ambulances w[illegible] in a [illegible]overs.

[illegible]

[illegible] and most important [illegible] of the [illegible] [illegible] with [illegible]

The [illegible] of [illegible] two [illegible] treatment [illegible] to [illegible]

(A) [illegible] — [illegible] wounds [illegible] formation of [illegible] and thickly [illegible] time [illegible] help them [illegible]

[illegible] well [illegible] and the [illegible] With the [illegible] the [illegible] caused by [illegible] shells. Shrapnel [illegible] frequent. The high explosive [illegible] from a few pounds to about [illegible] containing in a central cavity [illegible] These shells are usually [illegible] caused by the jagged fragments [illegible] explosion and also to some extent by [illegible] such as stones or bricks which [illegible] of the explosion. The fragments [illegible] and rugged and of every [illegible] the larger shells may tear off [illegible] smaller shells than may be [illegible] that the mere explosive force of [illegible] An [illegible] of this happened [illegible] killed by enemy [illegible]

The [illegible] clear were [illegible] came through [illegible] heavy fire [illegible] narrow passage [illegible] of about 100 ft. The result of the explosion [illegible] 100 ft. away was [illegible] passage by the [illegible] The nature of the wounds [illegible] and two of them had [illegible] high explosive shells [illegible] small "scatter

[illegible]

travel [illegible]

Have [illegible] them the [illegible] themselves.

This [illegible] and extent [illegible] before [illegible] and with [illegible] sleep [illegible] in melt [illegible] only a few [illegible] talk of them [illegible] too [illegible] collapse [illegible]

lips [illegible]
at the [illegible]

The [illegible] logical [illegible] would [illegible] mistake [illegible] tion was [illegible] it may [illegible] will [illegible] conclu[illegible]

Having [illegible] pass on [illegible] have [illegible] in a mil[illegible]

The [illegible]

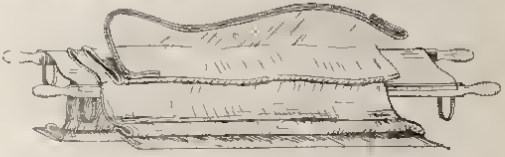
(b) Sl[illegible] evidence [illegible] general [illegible]

Sl[illegible] among st which [illegible] cold wa[illegible] mill p[illegible] the thigh [illegible] is difficult [illegible] the c[illegible] always [illegible] unusc[illegible] fact is [illegible] exa[illegible] tulv[illegible] surgical [illegible] left [illegible] stat[illegible] would sl[illegible] body heat. They [illegible] patients [illegible] ment is [illegible] avoided.

Ill[illegible] — Ha[illegible] the sensitively [illegible] complaint [illegible] During the w[illegible] increase [illegible]

He [illegible] first [illegible]

[illegible]



two double folds, and the free portion of each blanket is wrapped around him. The ends of the blanket at the feet of the stretcher are tucked in underneath the feet. He has this from thickness of blanket beneath him and two on top. In rainy weather a rubber sheet should be placed underneath him to protect him from further wet. If a blanket is available it may be folded along its length and placed over him, the head being tucked well in beneath the feet and the two corners brought up and secured along the legs by safety pins. This should be done so as to apply to the patient before the free portions of the two blankets are wrapped around him. He is now free from the bulkiness of blankets along his sides. By this procedure the maximum length is utilized in bringing blankets in this manner and is when thus adjusted they [illegible] protection as often happens when other methods are adopted.

[illegible] to minimize the obstacle [illegible] fashion which [illegible] bring [illegible] and [illegible] exposure [illegible] if clothes [illegible] [illegible] of the clothing [illegible] cut away when it [illegible] surrounds the wound and dressing applied rather than [illegible] the patient. The wound contains both some [illegible] bleeding which [illegible] complete exposure

[illegible]

[illegible] with [illegible] administration of morphia. The [illegible] the pain [illegible] are partially responsible [illegible] wounded man [illegible] the most valuable [illegible] treatment of [illegible]. With regard to the method [illegible] only one [illegible] which its full value may be [illegible] hypodermic injection. The oral administration [illegible] the tongue [illegible] recommended [illegible] liquid morphia. Hypodermics should be [illegible] from experience the Wildey bottle is the [illegible] outer metal cap to cover the rubber one which [illegible] keeps the rubber cap clean but preserves it from wearing [illegible] from constant friction while in the pocket. The bottle [illegible] the field is of the type in which antityphoid vaccine is [illegible] contains morphine sulphate each five minims corresponding [illegible] of a grain of morphia. Ten minims or one third of a grain [illegible] suitable and was made the standard dose. As regards syringes the Wildey was again found very convenient as being complete [illegible] which was fastened to the tunic at every time and moreover [illegible] together every time an injection was required. This was particularly noticed from experience with the infantry in the open warfare at the end when there was no stationary regimental aid post [illegible] the necessities of keeping up with the advancement of the battalion. This method of administration of morphia was found most useful when the battalion went over the top, the first occasion producing nearly 100 casualties in a few hours a time when the simplest and quickest methods are a great boon to the medical officer. Personally I always carried two syringes a Wildey, and the latest pattern of glass and metal (Dewin) in case of accidents. In my haversack I also carried a 4 oz. bottle of methylated spirits for flushing out the syringes occasionally.

The time of injection and amount should always be noted on the tally attached to the wounded man.

As far as other drugs are concerned pituitary extract has been found helpful in a number of cases. Also to prevent or counteract acidosis sodium bicarbonate should be given if possible to every seriously wounded or shocked man. In advanced anæmia it may be given by the mouth in doses of 30 60 grs. in water or tea.

Another valuable means of helping to combat shock in its early stage is the administration of fluids. Thirst next to cold, is a frequent complaint. Of the variety of hot drinks the best perhaps is tea with plenty of milk and sugar. It is the most generally acceptable, and at the same time the least frequently vomited for vomiting is common in severely wounded

[illegible] smooth a journey as [illegible] are factors which [illegible] the surgeons in the [illegible]

In [illegible] to many units there were [illegible] Resus[illegible] suffering from shock after the journey [illegible] more elaborately treated. Then [illegible] with applied by hot air from [illegible] his blankets, and from hot [illegible] ment. To quench thirst [illegible] bland drinks. Morphine pill [illegible] hor as a cardiac stimulant [illegible] injections were largely used [illegible] bleeding, not controlled by [illegible] method which increases [illegible] unless the case seemed [illegible] final. As a rule blood [illegible] the [illegible] stage when all bleeding [illegible]

[illegible] —

[illegible] limbs consist[illegible] extensive shells of large [illegible] a chemical [illegible] in the [illegible] constricting [illegible] the blood [illegible] behind to [illegible] illustrate what [illegible] was but in the [illegible] hill. The splinter [illegible] bleeding was so [illegible] although [illegible] examples is worthy [illegible] as the femoral [illegible] lines with [illegible] into [illegible] the Sth [illegible] on this [illegible] nearly 200 [illegible] which [illegible] amongst [illegible] here the [illegible] for [illegible] the [illegible] bullet [illegible] was [illegible] itself by [illegible] bal [illegible] instinct [illegible] apply [illegible] symph[illegible] was [illegible] the [illegible] Again [illegible] both

[illegible] hemorrhage is seldom [illegible] [illegible] [illegible] pressure with a pad over the [illegible] hospital is reached when [illegible] can be made from a [illegible] one on top of the other [illegible] avoided, as limbs [illegible] application of a tourniquet [illegible] regarded as a purely temporary [illegible] quet has been placed [illegible] and evacuated as promptly [illegible] of the round rubber tube is [illegible] buckle as it is more easily [illegible] circumstances permit severe hæmorrhage should always be [illegible] seeking for the bleeding vessel and [illegible] the wound to do so. If this is impossible [illegible] cutaneous or lack of surgical [illegible] and a tourniquet is out of the question [illegible] the wound may if possible be closed by sutures [illegible] and muscle and so circumvent [illegible] aneurysm in the hope that the patient will [illegible]

Any wound of a limb in which bleeding has had to be [illegible] trolled should be splinted as well as [illegible] of parting wall of an instant bleeding that has only been temporarily checked.

A type of wound which [illegible] it may not appear to be severe, is likely to give rise to [illegible] in which there is a slow continuous oozing that is at [illegible] sufficiently rapid to be regarded as severe hæmorrhage, but which in a long run may cause more loss to a patient than a brisker hæmorrhage that has received prompt treatment. Such a case may not be in [illegible] bleeding [illegible] will start his fight against sepsis [illegible] hæmorrhage, shock and sepsis go hand in hand.

The last factor in the general treatment of wounds is —

(4) *Sepsis.*—Speaking generally [illegible] should be regarded as either contaminated or already infected. [illegible] and their clothing has already been described and has [illegible] everything and bacteriological investigations of the [illegible] the skin have shown the presence of the most [illegible] organisms in all three. The sepsis to be most feared is the only [illegible] gas gangrene. The commonest [illegible] by the [illegible] bacilli are those where there is considerable [illegible] with interference with the blood supply. Shock and severe hæmorrhage predispose to gas gangrene owing to enfeeblement of the circulation. Prolonged use of the tourniquet has the same effect. Gas gangrene may

develop with alarming suddenness in wounds and [illegible] to the injury. An early and suggestive [illegible] in pain [illegible] by marked swelling. The [illegible] swelling in the early stage. The [illegible] and swollen and general symptoms [illegible] pulse rate and symptoms [illegible] with the step [illegible] living [illegible] the patient could be on an operating table within an hour of [illegible]. Even over the whole of the Western Front it had diminished [illegible] extent. It decreased with the improvement in evacuation and transport for the prophylactic treatment of gas gangrene [illegible] surgical and in order that preventive measures may be [illegible] taken. Also in [illegible] earlier years [illegible] with rich [illegible] and had recently been very [illegible] in the [illegible] area the face of the earth had been absolutely [illegible]. Exposure [illegible] and [illegible] by [illegible] animals had no doubt [illegible] to diminish [illegible] and virulence.

[illegible] on the local treatment [illegible] as well at this [illegible] to tetanus on the subject of tetanus. [illegible] wounds and the [illegible] tetanus since 1911 have been [illegible] by over 60 per cent. [illegible] (b) the more thorough treatment of the [illegible] the primary [illegible] very [illegible] in France [illegible] insignificant [illegible] prophylactic [illegible] tetanus serum [illegible] prophylactic dose which originally was 500 I.S.A. units but in some [illegible] to 1,500 units. With the [illegible] injection was [illegible] immediately the man was admitted to the Ambulance [illegible] with army units it was always given at the advanced [illegible]. Towards the latter part of the [illegible] cases of tetanus [illegible] French foot [illegible] the latter was also always treated by a [illegible] injection of anti-tetanic serum.

[illegible] Treatment with Reference to Special Wounds.—Surgery with [illegible] in France is a surgery of emergency and no operation [illegible] should be postponed until the arrival of the wounded man at [illegible] station or hospital, should be attempted. Operations for [illegible] which threaten life and those for the removal of hopelessly [illegible] are the only ones which ought to be done. The operation for the removal of a hopelessly smashed limb is not a formal one [illegible] anæsthetic [illegible] a dose of morphia. It is merely the completion of the work that the explosive has all but effected.

With regard to antiseptics and dressings they have all had their trial but with little difference in the direction of combating the onset of sepsis. In recent years it has been recognized that the infection is driven into

[illegible] and the [illegible] of immediate [illegible] [illegible] [illegible]

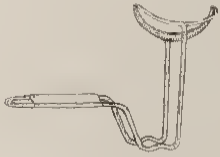
a hinge [illegible] better will the case be in every way at all stages [illegible] sly diminished and the patient stands a better chance [illegible]

Forearm splints.—There were various splints used in France for this fracture [illegible] were the most popular

(1) [illegible] splint with hinge especially for fractures near the [illegible] With this splint and [illegible] or splints [illegible] This splint is provided with a swivel just [illegible] splint can be brought down to the side [illegible] by a bridge attached to the wrist by a clove hitch [illegible] of the splint

[illegible] on humerus splint

[illegible] arm splint



Jones extension humerus splint

(3) [illegible] modified humerus splint This is a crutch splint with [illegible] splint

[illegible] and prevents the application of the above Bowlby's wooden angular splint is an excellent substitute It is fitted with a hinged back or flutter and can be used for either right or left arm This splint is very portable [illegible] taking up a small amount of room and causing very little extra weight

All these splints can be quickly and efficiently applied with very little trouble They are very simple and in consequence very good Of course

[illegible] may have used all the [illegible] is suited to [illegible] round the wrist [illegible] the chest [illegible] In some cases it [illegible] side of the arm.


[illegible] modified humerus splint


Bowlby's splint

Fracture of the Forearm.—Provisional immobilization may be obtained by putting it up in an internal angular splint. If definite immobilization is sought after, then a splint fixing the forearm in a position of supination with extension should be used.

Fracture of the Thigh.—This is the most important fracture of all. Patients with compound fracture of the thigh bear handling very badly. At one time the mortality from this wound was about 80 per cent., but with the supplying of all advanced units with Thomas splints this has been reduced to about [illegible] per cent.

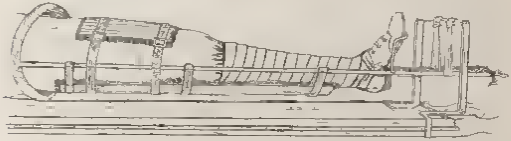
These splints towards the end were even supplied to regimental aid posts in the trenches, and in France the plan of putting on the splint in advanced areas without removing either trousers or boots was generally adopted. Thus used, the splint takes less time to adjust than a Liston, and can even be put on by the medical officer's staff. There are a few fractures of the femur that cannot be treated with Thomas splint, namely, those in which a wound has been received in the part covered by the ring. For these the old Liston splint is used.

The following constitutes the Thomas splint outfit as used in all advanced units in France:—

(1) Thomas knee splint.
(2) Posterior supporting splint.
(3) A short external splint.

[illegible] piece for preventing rocking of the foot
[illegible] suspension bar
[illegible] bolles

[illegible] as follows An assistant [illegible] extension all the time the splint is then applied [illegible] been applied to the splint The [illegible] the neighbourhood [illegible] so as to give the knee a slight [illegible] in a length of limbage and applied [illegible] supporting splint is then applied and the clove [illegible] the notch at the end of the splint the turns of the bandage [illegible] opposite directions over the notch and tied in [illegible] half [illegible] splint is next suspended from the stretcher suspension bars [illegible] ways past each of the stretcher the anterior splint is then [illegible] applied to keep it and the support splint in place Finally the [illegible] placed in position to prevent rocking of the foot The application of the splint in this manner is very simple It is applied in [illegible] Thomas Liston has immeasurable advantages over the [illegible] the mortality by over 60 per cent



If the suspension bar and foot piece are not available the projecting end of the Thomas splint may be supported on a petrol tin &c so as to keep the heel free from the stretcher and the foot should be fixed by a figure-of-eight bandage If a back support is not obtainable the leg of the trousers should be cut down in front and pinned over each side bar of the splint

If a man was picked up on the field with a compound fracture of the thigh, and no Thomas or Liston's splint available the following improvised means of temporary fixation was found useful A putter or bandage was passed under the perineum and round the handle of the stretcher opposite the injured side at the head of the patient pulled tight and tied Another bandage was then passed by means of a clove hitch round the ankle of the injured leg extension applied and the bandage tied to the handle at the foot of the stretcher on the same side as the injured thigh A couple

[illegible] to the [illegible] tapes [illegible] usually [illegible] the [illegible] bandage [illegible] putteed [illegible] the foot stationary and [illegible] was generally [illegible] against the [illegible]

Fractures of the Leg.—For the upper [illegible] splint as used in [illegible] of the thigh [illegible] lower part a back splint with foot piece and [illegible]

Wounds of Joints.—All wounds of [illegible]

Wounds of the Head.—These should [illegible] and pressure into the hole in the skull [illegible] these cases should be prepared up

It is extraordinary what injury extensive lacerations can take place without immediate fatal results

During the [illegible] before the armistice [illegible] who had the upper part of the occipital and a great deal of both parietal bones removed by shell crushing, great disintegration of brain [illegible] I did not think it worth while sending the stretcher bearers [illegible] there was any chance of his being resuscitated [illegible] After twenty four hours [illegible] the man was still alive [illegible] reached the advanced dressing station in more or less condition than when he left the regimental aid post. I [illegible] nothing more about this case [illegible] it was impossible to keep in touch with the after history of wounded in this stage of the war

Wounds of Chest.—The [illegible] should be operated as soon as possible for operation. Open sucking wounds should be dressed temporarily by either by suture or cotton, [illegible] gauze [illegible] by occluding the opening with strapping. The chasing of the [illegible] wounds gives great relief

Wounds of the Abdomen.—Owing to the [illegible] accurate diagnosis in abdominal wounds it is better to regard all wounds of the abdomen back and buttocks as potentially penetrating, unless there is positive evidence to the contrary. These should be evacuated as [illegible] possible

Before leaving the subject of the [illegible] it may be as well to point out that where there is [illegible] to a bombardment with gas shell or the enemy is [illegible] may send gas shell over along with high explosive [illegible] the dud-like explosion of the former and [illegible] at the [illegible] detection. If the unit is localized the medical officer [illegible] with gas measures for the protection of his wounded [illegible] and should he have chest cases they should be invariably [illegible] chest impinks and box respirators [illegible] harm once

We now come to the last heading under the medical organization namely —

(3) THE [illegible] OF THE WOUNDED

The [illegible] from the [illegible] advanced dressing station is done by [illegible] dressing station by motor ambulance [illegible] casualty clearing station [illegible].

With the [illegible] transport [illegible] ambulances [illegible]. An [illegible] the Belgian hospital [illegible] the Belgian Army [illegible] during the greater part of the war. The [illegible] at different periods [illegible] for a [illegible] while occupied by the former [illegible] to the [illegible] casualty clearing station at Oosthoek [illegible] casualty clearing station or the Belgian hospital [illegible] Dunkerque or Calais and finally [illegible] England.

When casualties took place in a battery [illegible] was immediately telephoned [illegible] what battery he could be found [illegible]. The [illegible] immediately went to the place [illegible] carried them on stretchers to a place [illegible] telephone that the ambulance should [illegible] time was [illegible] communicated which was when the shelling had [illegible], so that [illegible] to the ambulances should not be [illegible].

The Ambulance de l'Océan at La Panne, to which casualties were sent, was [illegible] and had a staff of the best surgeons and physicians in Belgium, they having been driven back from Brussels and [illegible] by the German occupation. The hospital had six modern operating rooms [illegible] three operating tables, so that eighteen operations could take place at the same time either by day or night.

[illegible] few words is the technique adopted by the hospital under the command of Dr. A. Depage as translated from an article by Dr. G. [illegible] Université de Louvain. The wounded man at [illegible] the hospital is received by the medical officer [illegible] the temporary dressings and [illegible] the nature, the location [illegible] of wounds. He looks for the eventual existence of any [illegible] haemorrhage, fracture, joint or nervous [illegible] result of his examination on the [illegible] preparation of the region [illegible] he afterwards applies a large [illegible] the wound, and if there is need he asks for a radio[illegible]. During this time the wounded man has been [illegible] if he does not show any manifesta[illegible] assigned to him. From [illegible] the preliminary toilet is [illegible] possession of all the diagnostic parts

[illegible] on the [illegible] [illegible] presence of a fracture [illegible] these given particulars suffice to [illegible] the location of a bullet [illegible] perforation or not. We provisionally [illegible] operating if the wound is a simple bullet wound with [illegible] and exit and without any visceral or vascular lesion. In [illegible] wounded man is put to bed and kept under observation [illegible] frequent course of events. Nearly always the wound [illegible] intervention.

The surgical treatment of wounds was [illegible] that adopted by British surgeons: excision [illegible] the cavity combined with resection of all contused and [illegible] and removal of all fragments of clothing or other foreign bodies. The after treatment was by Carrel's method with Dakin's solution.

In conclusion, it will thus be seen that the [illegible] applied for the immediate treatment of casualties with an advanced unit in simple for the conditions under which the men are wounded [illegible] allow the performance of any elaborate [illegible]. Surgeons at the base would be less likely to criticize and would get a wider view of war surgery if they went around the forward areas [illegible] and learnt the conditions under which wounded are collected.

Surgery with an advanced unit is surgery of emergency only, and the medical officer who can land his patient at the next stage of the journey as quickly as possible in best condition serves his country best.

Clinical and Practical Notes

BLOOD PRESSURE NOTES

By Surgeon Commander C. O'Connell, R.N.

Sphygmometry

[illegible]

Estimation of the Blood Pressure

[illegible] is rapidly becoming a routine [illegible] the [illegible] and the [illegible] remarks on the interpretation of the results obtained.

The [illegible] of the estimation of the blood pressure [illegible] by Riva-Rocci in 1896 many types of sphygmomanometer [illegible] placed on the market; these types can roughly be divided into (a) those in which the reading of the height of a column of [illegible] of the operation, (b) those of the aneroid type [illegible].

The [illegible] is the Tycos made by Short and Mason Ltd., of Wathamstow [illegible] is to my mind the best instrument on the market [illegible] Journal of the Royal Navy Medical Service), it will [illegible] later on.

Mechanism of the Circulation

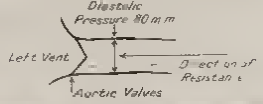
[illegible] The arterial system is maintained by the elasticity of the vessel walls and by the tendency of the outflow to remain in excess of the outflow in the [illegible] effect on of the left ventricle supplies the energy which drives [illegible] the arteries. The instant the pressure wave passes through the [illegible] the stretched walls recoil thus rendering some of the energy expended by the heart potential in the arterial walls. There is a rapid increase in [illegible] as the blood stream reaches the periphery, which develops a strong [illegible] to the circulation of the blood. In the arterioles this resistance has [illegible] diminished the pulse pressure and the systolic and diastolic pressures are practically equal. The calibre of the arteries is also influenced by the vasomotor nervous system and probably also by the secretions of the ductless glands. It is evident that that estimation of the blood pressure involves the determination of the systolic or maximal and the diastolic or minimal pressures.

Systolic Pressure is the pressure in the arterial tree produced by the heart's contraction. It represents the whole heart energy. It is also called the maximal pressure and is the highest of all three pressures.

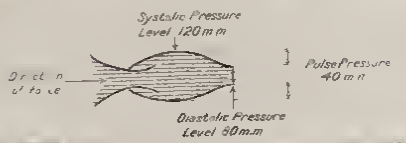
Diastolic Pressure is the pressure in the arterial circuit occasioned by the

[illegible] diastole of the heart. It is the [illegible] the [illegible] con[illegible] force. It is also called the [illegible] pressure. It is the [illegible] mental pressure range.

[illegible] represents the efficient work of [illegible] is the [illegible] against the peripheral pressure [illegible]. It is [illegible] over and allow that [illegible] the valves renders the [illegible] in the [illegible] the blood manifests [illegible]



[illegible] the left ventricle [illegible] and force [illegible]



[illegible] which left ventricle and arteries [illegible] has been overcome by a [illegible] of the [illegible] the pulse pressure 40 mm [illegible] is [illegible] relation.

Remarks on Interpretation of Results

A correct interpretation of the blood pressure phenomena on a theoretical standing of the circulation and its mechanism and upon proper co[illegible] of the three factors and their relations to each other.

For example. A systolic pressure of 130 mm which is [illegible] may in fact represent the total power of a failing heart as well as one in a [illegible] an arteriosclerotic diastolic pressure of 110 mm and a pulse pressure of [illegible]. The same conditions may be present with a systolic 180 mm and a [illegible] 110 mm.

In this instance the high tension may call for a pulse pressure of [illegible] amount actually diminished. Again a normal systolic pressure of 14[illegible] accompanied by a diastolic pressure of 60 mm is [illegible] with an incipient [illegible] endocarditis form of aortic disease. A pulse pressure almost equal to [illegible] pressure is often found with a normal systolic [illegible] and high [illegible].

A falling systolic may be very significant [illegible] of the heart which gradually causes decompensation and a high-tension [illegible]

[illegible]

[illegible]

[illegible] sh[illegible] and [illegible] will [illegible] as the [illegible] and [illegible] on the [illegible] but [illegible] a sec[illegible] tubing.

Th[illegible] his mi[illegible]

Deflw[illegible] the Blood [illegible]

By [illegible]

[illegible]—The patient s[illegible] in a con[illegible] and completely [illegible] is placed well on the [illegible] the [illegible] ler of the [illegible] the last law in the [illegible] —The sleeve [illegible] applied well [illegible] on the [illegible] thus o[illegible] n false standing.

The [illegible] attached to [illegible] other one and [illegible] muscles of his [illegible] and fore a[illegible] The [illegible] places his str[illegible] sec[illegible] hose.

The [illegible] water [illegible] upper or [illegible] column. The [illegible] —

(1) [illegible]
(2) [illegible]
(3) [illegible]
(4) [illegible]
(5) [illegible]
(6) [illegible]
(7) [illegible] lowe[illegible] [illegible] low the [illegible] pressed [illegible]

[illegible] Strikv water [illegible] Pa[illegible] have by

[illegible] of the blood [illegible] the external pressure [illegible] lesions and in [illegible]

[illegible] lower the [illegible] and is least [illegible] of systolic [illegible]

[illegible]—The [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] two other methods [illegible] These methods are [illegible] that they are only [illegible]

The mean pressure [illegible] are subjected [illegible] diastolic pressures

When to take Blood Pressure

A blood pressure [illegible] every patient and in [illegible] intervals for the pulse [illegible] the result [illegible] regards applicants for [illegible] police, fire [illegible] athletes and of all persons [illegible] should be routine [illegible]

Normal Blood Pressure [illegible] the pressure is 10 mm less than [illegible] lower than the systolic

A systolic pressure [illegible] or above 90 may be regarded as [illegible] pathognomonic

Variations in Health.—The pulse [illegible] to wide variations compatible with [illegible] position exercise excitement [illegible] examinations will lead to their [illegible]

Humidity.—High temperatures [illegible] and diastolic pressure

Altitude.—Very probably causes [illegible] is only temporary if the interval [illegible] this pressure normally lower in higher altitudes

Old Age.—Being usually accompanied by [illegible] general [illegible] of disease as well as degeneration of the arteries [illegible] higher blood pressure

Different Parts of the Body.—The readings vary in the same individual due to factors of arterial wall resistance [illegible] of closure. Readings taken in the legs are usually higher than those in the [illegible] the reading in the left arm is usually higher than that in the right arm

[illegible] Leaide[illegible] may be [illegible] dilatation [illegible] cerebral [illegible]

[illegible] to tell the operation is h[illegible] will be [illegible] ort as the lab is being [illegible] of [illegible] sure is spend

[illegible] y tole bl el pressure is al [illegible] D [illegible] ing the [illegible] l pomos the general [illegible]

[illegible] theguemom [illegible] pulse press re [illegible] ide of the two [illegible] nce is [illegible]

[illegible] ast [illegible] of the [illegible] l lictors [illegible] l el [illegible] on [illegible] ly that [illegible] all [illegible] ndeme [illegible]

[illegible] leer [illegible] lsily [illegible] ply o [illegible] of [illegible] g of [illegible]

[illegible] peripheral [illegible] l by [illegible] in the [illegible]

[illegible] ng of the [illegible] left ventricle [illegible] tend by the [illegible] such cases [illegible] in spite of [illegible] or of the [illegible] l distribu [illegible] is all pul of [illegible] in a very

irregular manner affecting different parts of the arterial [illegible] almost haphazardly

Hasenfeld and Hirsch by careful investigations proved definitely that arterio sclerosis leads to a hypertrophy of the left ventricle only when the splanchnic arteries or the aorta above the diaphragm are the seat of advanced disease The arteriosclerosis of the rest of the vascular areas does not appear to exert this influence

Low Blood Pressure

Causes of Hypotension —(1) *In wasting diseases* and cachectic conditions such as advanced phthisis, carcinoma of the stomach and general paralysis of the insane

The brown atrophy of the heart found post mortem in these conditions bespeaks a diminished output of cardiac force, and the reduction in the blood volume is equally shown by the small and empty pulse during life

(2) *Drugs, Infections Hæmorrhage* —Poisonous doses of drugs which paralyse the vasomotor centre or heart naturally result in a fatal fall Chloroform is the most important of these and the low arterial pressure which occurs early in chloroform anæsthesia needs careful watching

(3) *Depression of the Nervous System* as evidenced by exhaustion of the centres and in conditions where a large quantity of fluid is removed from the circulation as in hæmorrhages or in shock where the blood collects in the various reservoirs

A low systolic and pulse pressure, with a comparatively high diastolic pressure usually indicates myocardial weakness and if it is also accompanied by disease of the kidneys and arterial sclerosis without compensation is a prognostic sign of the worst import

In *tuberculosis* the blood pressure is always low, and in cases where the blood pressure remains persistently low the probability of the tubercle bacillus being the exciting cause should not be forgotten

Blood Pressure

In Valvular Heart Disease —Regurgitant aortic disease is the only valvular disease in which the pressure of the blood shows marked variations from the normal, they show a constantly high pulse pressure which is almost pathognomonic of the disease aortic insufficiency

Owing to the fact that the clinical sounds used in estimating the blood pressure are heard over the uncompressed artery the estimation of the diastolic pressure is a little difficult, but it is always very low i e 40 mm

In Nephritis —(a) Chronic interstitial nephritis This is really a combination of disease of kidneys, arteries and heart combined

Permanent high pressure is one of its salient features the blood pressure is higher in this disease than in any other The high pressure is probably caused by the favorable action of the hypertrophied heart

[*Note* —Cases of contracted kidney without hypertension do occur but they are very rare (Gross's case)]

It is by the use of the sphygmomanometer that this disease may be easily detected The enlargement of the heart requires skill to make out and with obesity, baffles the expert The urinary changes are not constant albumin and casts are frequently absent and even quantity and specific gravity may be at times normal While not a pathognomonic sign it is nevertheless so striking that it puts the observer on the alert

(*b*) *Other Forms of Chronic Nephritis* —This heading is used because the diagnosis of the various types of so called chronic parenchymatous or diffuse nephritis cannot be made accurately during life

In amyloid kidney, cardiac enlargement regularly fails, in the chronic hæmorrhagic form normal or subnormal readings are frequent

(c) [illegible] This term embraces a more heterogeneous group of conditions [illegible] Everything from slight cloudy swelling to the most intense [illegible] is included

While [illegible] of nephritis following scarlet fever the influence of the [illegible] on the blood pressure is not sufficiently striking from a clinical point of view [illegible] justify comment In glomerular nephritis there is a rapid rise in the blood pressure according to the observation of Traube Riegel and others

The great difficulty in arriving at a satisfactory estimation of the blood pressure in acute Bright's [illegible] the *edema* even slight grades of it produce an error and when it is at its [illegible] accurate observation is impossible

In Arterial Disease [illegible] In arterio sclerosis the mechanical factors affecting the blood pressure tend to simulate those in a rigid system of tubes, it is giving a high systolic pressure at the beginning of systole *rapidly* falling owing to the sudden outflow into the dilated vessels If, however the peripheral vessels are contracted and the outflow small the pressure in the non elastic arteries quickly rises and remains so throughout systole *gradually* falling through diastole

The first condition gives a low diastolic pressure, the second a high diastolic reading

Note —The increased high pressure in the arteries is the cause of the cardiac phenomena observed in kidney disease while in contracted kidney the fall of this pressure forecalls the onset of cardiac failure

Important Cardiovascular Symptoms —It is impossible in the scope of these notes to consider the relation of all the clinical features of cardiovascular disease to the blood pressure Practically all of them are due rather to the condition of the neuro muscular apparatus of the heart in relative to the demands upon it rather than the absolute semi tonic of those demands

The chief importance of a knowledge of the blood-pressure in connection with dyspnoea or distress on exertion, or other forms of heart impairment lies in its testimony as to the existence of an unnecessarily high peripheral resistance which may be combated by suitable treatment

The volume of the pulse irregularities may be well studied by the careful watching of the recording needle of the Tycos instrument, as well as the employment of the sphygmograph

In Uræmia —The prognostic value of the sphygmomanometer in this disease is very great Leguer first called attention to this fact His cases showed a rise every time the symptoms became more marked and a corresponding fall when "packs" were applied The terminal fall in his patients began a few days before death and was attendant on obvious signs of cardiac failure Thus in uræmia high blood pressure, or the increase to a higher pressure than is usual to the patients forecalls the onset of an attack

In Obstetrics —Blood pressure readings should be taken as a routine measure during pregnancy as they give the *earliest* and most *constant* sign of impending eclampsia

The normal blood pressure in healthy pregnant women averages about 116 mm although it may vary from 100 to 130 mm, and still be consistent with perfect health

A rise of above 130 mm should be regarded as of importance, and the case carefully watched and eliminative treatment considered

A tendency to rise in the blood pressure even if below the high point (130 mm) should be looked upon as a suspicious event in the routine of the patient's health

Very low blood pressure (100 mm or less) in pregnant women should lead to a careful consideration after a careful examination, as to whether the patient should be considered fit to undergo the labours of parturition

[illegible]

[illegible] Coma The [illegible] should [illegible] is [illegible] [illegible] such [illegible]

The [illegible] plane [illegible] expres[illegible] es, does [illegible] per minu[illegible] of good [illegible] is higher [illegible] millimetres [illegible] arterial circu[illegible] greatly disorganised

This law is of great value to the physician and should also [illegible] is highly important to distinguish circulatory failure accompanied by *low* pressure, from a similar condition accompanied by a *high* blood pressure In the one instance the heart must be *stimulated* in the other the blood pressure should *be lowered*

In Typhoid Fever —In typhoid fever more than in any other acute disease the sphygmomanometer has proved its worth

As a guide in treatment it is a help in the diagnosis of perforation and its differentiation from acute collapse or syncope and because it affords an additional prognostic standpoint it should be universally employed

To be of any service the blood pressure should be recorded at the stated intervals *in the morning and evening* best on charts Typhoid fever is almost invariably hypotensive in character as Petain in 136 cases Grele in 115 and Alezais and Francois showed in 100 cases

The fall in pressure begins in the first or second week and goes hand in hand with the development of the toxæmia The absolute pressure means little of itself the important thing is the general course of the pressure

Grele's figures (he used the Riva Rocci or cuff armlet apparatus)

In 115 cases *the highest pressure*	135 mm
the lowest "	71
the mean	104

The mean pressure of all cases by weeks of the disease was as follows *First week* 150 mm *second* 106 mm *third* 102 mm *fourth* 96 mm *fifth* 98 mm Nothing could better illustrate the gradual development of the hypotension than these figures

Hæmorrhage and Collapse in Typhoid —A *slow* progressive fall is evidence of increasing weakness of the vasomotor centres, and of the danger of impending collapse. It calls therefore for stimulating medication A *rapid* fall suggests hæmorrhage Neither Cook and Briggs nor Alezais and Francois failed to observe this phenomenon in any case All other complications are attended by some fall in pressure except pneumonia and perforative peritonitis

Perforation in Typhoid Fever —In this condition Grele and Briggs have both found a *sharp* rise marking its onset, the hypertension is, of course, only temporary as the pressure soon falls again according to the degree and extent of the hæmorrhage

Since the differential diagnosis of perforation is always difficult and the other complications which may intervene e g , concealed hæmorrhage and acute collapse, produce a fall the sharp elevation of the pressure may be of inestimable value to the physician

[illegible] the blood pressure is well [illegible] [illegible] the type of high blood pressure [illegible] healthy persons [illegible] not bad [illegible] either in [illegible] for the certain [illegible] These [illegible] Thomas's contention that an [illegible] reaction manifesting themselves [illegible]

[illegible] M[illegible] is a valuable guide in controlling the [illegible] is the indication to stop the within [illegible] an adult patient with [illegible] 110 mm [illegible] is a safe indication to stop the further injection of the solution

[illegible] The diagnosis of true angina, well marked hypertension is evidence [illegible] Though some cardiac hypertrophy and a systolic aortic [illegible] murmur are common findings and when taken [illegible] with the characteristic sensations of the patient stamp the attacks as being [illegible] angina yet in a certain number of cases, no anatomical change is demonstrable by [illegible] physical diagnostic means In such cases a high blood pressure (160 mm or more) the sequelæ pain can be held to be due to the coronary [illegible] as the pain itself as MacKenzie describes it being [illegible]

In Anæsthesia — The blood pressure readings in a person under the influence of an anæsthetic are of great importance more particularly in the use of chloroform

In America the routine of [illegible] the systolic pressure during the operation is very general It can be [illegible] and out by the assistant and only the systolic pressure is required

Some notes on the behaviour of the pressure with various anæsthetics are appended

(1) Ether —Generally [illegible] *of the systolic pressure* is the first and second [illegible] due to the excitement and the muscular action but in full surgical [illegible] it falls to near the normal

According to Cook and Briggs it never produces hypotension unless causes [illegible] block or cardiac failure [illegible] as the patient comes well under the influence of the drug the pressure falls accordingly as the other salivation [illegible]

Then the pressure tends to the normal or just below it ether ization of the [illegible] Yet drop below this level should cause the administration of the drug to be suspended and oxygen admitted

(2) Chloroform — The danger of sudden death in chloroform narcosis is [illegible] present to the mind of the administrator and thus the *frequent* and *rapid* [illegible] of the blood pressure is of great value more especially of course in [illegible] operations where it is necessary for the patient to be deeply anæsthetized [illegible] prolonged period

[illegible] all but about 10 per cent of chloroform anæsthesias blood pressure [illegible] *show a fall of from 10 mm to 40 mm*

Note —The patient's blood pressure under normal conditions as low as possible [illegible] taken two or three times if possible some days previous to the date of the operation]

(3) Nitrous Oxide causes, as one might expect, hypertension due to the partial asphyxia it induces

According to Cook and Briggs, using Janeway's sphygmomanometer, when nitrous oxide is given with ether it eliminates the hypertension of the second stage of narcosis the patient passing directly from the first stage to the third the lower pressures of deep narcosis

[illegible]

[illegible] subsidiary [illegible] ledge of the [illegible] this effect [illegible]

[illegible] cause of [illegible] plate and [illegible] movements of the capillary [illegible] picture that if the [illegible] conditions [illegible] constant [illegible] hop in the high arterial [illegible] [illegible] stung, will [illegible]

[illegible] person shows no symptoms [illegible] a quite adequate rate of flow so [illegible] would be a work of super [illegible] blood pressure generally will be greatly enhanced [illegible] to [illegible] various factors which are in operation to [illegible] capillary sides, and when we are as a result of such [illegible] to correlate the rate of capillary blood flow to the arterial systole and diastole in pressure then and then only will we have the true guide to treat [illegible] A new field of investigation however, is lately presented for our researches in the skilled use of the electrocardiograph and the not less skilled interpretation of the resulting electrocardiograms

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SIMPLE HINTS ON NOSE THROAT AND EAR CASES

By Surgeon Commander H M BRAITHWAITE M D R N

These few notes are written in response to requests for some plain practical information suitable for ordinary naval medical officers with the ordinary instruments at their disposal in an ordinary sick bay

The nose is considered first because so often it is the source and origin of many ills in the throat and ear Air drawn through the nose is filtered warmed and moistened Mouth breathing produces dryness of the mouth fauces pharynx and larynx sepsis of delayed resolution and frequently hypertrophy of the faucial and pharyngeal tonsils Eustachian catarrh follows with defective aeration and drainage of the middle ear and defective hearing at first intermittent later permanent It is of great importance that children and young adolescents should be taught to breathe through their noses especially after operation for the removal of tonsils and adenoids

Now I would suggest that at physical training classes special care should be taken that all the members should breathe through their noses and that anyone who could not do this should be sent to the sick bay for examination

Frequently one finds that although there is nothing wrong with the nose mouth breathing is the habit Re education will cure this and the physical training class is a good means of doing it Test each nostril separately placing a thumb or finger over each anterior nares and getting the patient to breathe in and out through the nose with the mouth shut If one or other nostril is obstructed look at the nose for signs of injury or disease and get a history as complete as possible Then put on the forehead mirror of the laryngeal set and reflect some light on to the anterior nares Daylight is the best lighting that any electric light will do Then take the largest sized ear speculum supplied with the Brunton s otoscope insert it into each nostril in turn and reflect the light through it First

[illegible] usually [illegible] the nose. [illegible] with their [illegible] when or [illegible] to examine the [illegible] is all [illegible] looking at the [illegible] not the [illegible] farior [illegible] be seen [illegible] of the [illegible] nasal cre[illegible] the superio maxilla [illegible] nous [illegible] with [illegible] little. [illegible] is the [illegible] The [illegible] may be [illegible] could not [illegible] the latter [illegible] post on, [illegible] kind of sou[illegible] quickly grow [illegible] and are the result of [illegible] fore they [illegible] memorial. [illegible] curious [illegible] the septo[illegible] of [illegible] fection [illegible] sense of the necessi[illegible] elaborate [illegible] thus for its elucidation [illegible] simple in the se[illegible] Vilant. The [illegible] would ha pain if an ulcer[illegible] the frontal sinuoidal or [illegible] regions and tenderness o[illegible] pressur the [illegible] and possibly discharge of [illegible] se. The pain [illegible] the nil the meatus and the quantity [illegible] holding the head until the [illegible] and [illegible]. The symptoms [illegible] in the course [illegible] influenza without serious [illegible] for palliative treatment [illegible] and the inhalation [illegible] are suitable.

[illegible] is epistaxis really always [illegible] small ulcer on the anterior [illegible] part. In a normal [illegible] has not he seen [illegible] cotton [illegible] pressure [illegible] pack [illegible] soaked with [illegible] solution.

[illegible]—Before examining the [illegible] for the [illegible] high arched palate [illegible] and [illegible] things is [illegible] of teeth [illegible] and [illegible] teeth. The tonsils [illegible] small so small that the [illegible] in the pillars of the [illegible] the size so much as the septum of the tonsils that really [illegible] tonsil in this [illegible] may be [illegible] the [illegible]. Look [illegible] pus at the [illegible] of the lacunæ [illegible] squeeze the tonsils to [illegible] out often the [illegible] will [illegible] the depressor is [illegible] on his [illegible]. Large tonsils and septic tonsils will often clear up by [illegible] attention [illegible] breathing, supplemented by [illegible] cleansing treatment, [illegible] pressing, the to get the epiglottis may be seen. This has been mistaken [illegible] tumour.

[illegible] of the naso pharynx is not easy, especially in [illegible] smokers and [illegible] is hardly [illegible] as any instrument is introduced into the mouth. It is [illegible] necessary to paint the base of the tongue, fauces and nasal with 5 per cent cocaine to which a few drops of adrenalin (1 1 000) is added. The smallest laryngeal mirror supplied does perfectly well. One must avoid touching the posterior pharyngeal wall in [illegible] the patient to breathe quietly through the nose if possible serves to relax the soft palate. Then the posterior nares, the orifices of the Eustachian tubes, and the adenoid area can be seen, and the mucous noted.

THE LARYNX.—No one can be long in the Service without being impressed with the great number of disability caused by diseases of the ear and I think I am quite right in saying that just half of it should not occur.

Out of eight thousand consecutive cases of chronic suppurative otitis media included from among the patients of the Royal Naval Hospital Chatham in [illegible] prior to entry cases by the patients own confession [illegible] directly [illegible] in that class. Most of the patients denied [illegible] on entry a paper containing the paragraph [illegible] continuence of mine or discharge from the ears. This is a problem for the consulting officer.

S[illegible]—No ear should be syringed without having first been examined. If wax is present an alkaline solution simply sodii bicarb. a drachm to a pint, should be used and considerable force may be applied. If the cerumen is very hard a few drops of alkaline solution should be left in the meatus to soften the wax and the syringing repeated next day. If syringing should be required for removal of pus and debris it should be done gently. Furunculosis is one of the most troublesome and painful affections of the external ear. The pain is acute, worse on touch, the mandible and on pressure over the tragus and on manipulation of the ossicle. The lymphatic glands in front of the tragus and over the tip of the mastoid process are tender and swollen, the latter sometimes misleading, one in a diagnosis of mastoiditis. The meatal wall is swollen. The meatus must be gently washed out with warm alkaline lotion to remove wax and debris and some soothing drops put in, *e.g.*, ac. carbolic 1 part, glycerine 40 parts, and large lomentum applied. As soon as it is mature the furuncle must be loosened and pus exposed. This little operation is very painful and a short general anæsthetic is advisable. After incision dress the meatus frequently with antiseptics. Alcohol on gauze is a good dressing.

Acute otitis media is a serious condition with which every officer must be able to deal at any moment. The most prominent symptoms perhaps are headache, deafness and fever. The pain is intense and is aggravated by pressure on the tragus over the antrum and tip of the mastoid process, not by manipulation of the ossicle. The patient should be sent to hospital if possible. If this is not possible the meatus should be gently washed out with alkaline lotion and large lomentations applied to the affected side. An inhalation of steam with tr. benzoin co. ℥j creosote ℥iiiss to a pint of boiling water for a quarter of an hour twice a day helps to reduce inflammation in the Eustachian tube and tympanum. If suppuration and perforation of the drumhead occurs the meatus must be kept clean and aseptic and drained. Wash it out with lotion, dry with sterile wool and insert a sterile gauze drain and repeat the process as often as the soiling with pus becomes visible. Go on with the inhalation.

Chronic suppurative otitis media is prevalent in the Navy as everyone knows. The number of cases could be considerably diminished by more careful examination of recruits and greater attention to the ears and the throat, particularly to nose breathing. It is beyond the scope of this paper to enter into the details of this disease in its many varieties and therefore I will merely state very briefly the indications for sending the patient to hospital. Defective hearing so great as to interfere with the patient's duties, loss of, and the presence of blood in the discharge, sudden cessation of the discharge with pain in the antrum and mastoid process and fever or rigors, onset of dizziness or facial paralysis are signs that call for the transference of the patient to hospital.

Many cases can carry on their duties as has always been the custom attending for palliative treatment when discharge is present. They may have a slight defect of hearing and an intermittent discharge, but it would be a pity from a Service point of view, to lose a highly trained man because of these symptoms, causing little or no disability. Wireless telegraphy operators need stricter rules; they should have perfect ears.

Palliative treatment would mean attention to the general hygiene, especially of the nose and throat, cleansing the meatus and middle ear as far as possible, by douching, aseptic drops, *e.g.* hydrarg. perchlor. gr. ¼, spts. vini methyl. ʒi, and antiseptic inhalations.

Gun Deafness.—Many patients attribute their otorrhœa to gunfire whereas it has been merely re-awakened. A pathological ear, *e.g.* with a perforated drumhead or blocked Eustachian tube will suffer more from gunfire than a normal ear. Sudden explosions may cause rupture of the tympanic membrane when deafness is the most obvious symptom, and haemorrhage the most obvious sign.

A Hurt Cor[illegible] in these cases The prognosis [illegible] on whether [illegible] or not Do not syringe [illegible] ear Clean [illegible] with antiseptic lotion and [illegible] dry antiseptic [illegible] Rest and [illegible] are time

The most [illegible] effect of [illegible] the ear is concussion of the labyrinth One might say with truth that the ear is normally One's ears hiss and partial deafness [illegible] These symptoms soon pass off but prolonged or repeated exposure produces permanent lesion of the cochlea and I should like to [illegible] here a plea for [illegible] affected in this way They should have a Hearing Certificate [illegible] after say one month the hearing is not restored and the tinnitus vanished Complaints with a law cause of deafness brought up for [illegible] in which a definite history of concussion from gunfire is [illegible] and where no pathological lesion after three nerve deafness can be discovered but [illegible] there is no [illegible] evidence of injury, the condition [illegible] down [illegible] but little nor aggravated

The diagnosis of [illegible] deafness is unfortunately based mainly on symptoms, [illegible] and resort to the hard [illegible] testing the alleged deafness to such reflexes as the cochleo palpebral [illegible] a noise applied to an ear that hears causes winking [illegible] observation of the [illegible] implies a relative integrity of the internal ear

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ANÆSTHESIA BY NITROUS OXIDE OXYGEN ETHER (WITH DR H E G BOYLE'S APPARATUS)

By Surgeon Lieutenant Commander A B CLARK M B B S Lond D P H R N

Having used the above method of anæsthesia at the R N Hospital, Chatham, since February 1908 for a large variety of operations I feel that a few remarks on my experience with it may be of interest to some

I have seen one or two brief remarks recently on the value of this anæsthetic and most of them refer to the lack of portability and to the high cost of use but I have seen no estimate of the actual cost and propose to attempt a rough estimate of this from records kept by myself of the amount of gases used since the introduction of this apparatus to this establishment The cost of the complete apparatus, from Messrs Coxeter London is £18 2s 6d There can be no doubt that it is of very great value for use in hospitals and the following advantages, of many may be briefly stated

(1) It is pleasant to take and only a short time is required (usually four to five minutes) to get the patient under and he can be kept under for any length of time

(2) The patient is [illegible] very soon after the mask is removed frequently before leaving the theatre, and the after effects are slight and 'after nursing' is thus simplified

(3) Any vomiting that occurs is usually completed while the patient is on the table and before he returns to the ward

(4) Shock appears to be reduced to a minimum and the patients feel fitter within a few hours than they do twenty four to forty eight hours after with chloroform or ether

(5) At any time during the administration the gas may be turned off and oxygen given alone if desired for reasons of shock, &c

Method of Administration —The following points are mentioned as a guide to those who have not had experience with Boyle's apparatus —

(1) A preliminary hypodermic injection of morphine and atropine should *always* be given about half an hour before the operation or there will be difficulty in obtaining and maintaining a satisfactory anæsthesia

(2) The m[illegible] nose completely and once applied should never be [illegible] ration

(3) It is [illegible] from one side hole and nitrous oxide from all [illegible] the tube as well and to turn the position to no [illegible] and out of the lung

(4) The bag [illegible] le and kept full is the gases should always be [illegible] breathes a

(5) In most cases [illegible] complete relaxation of muscles and deep anæsthesia are [illegible] necessary to turn on the other to complete the anæsthesia and [illegible] little is required throughout

(6) There is [illegible] between individual patients in taking this anæsthetic but as [illegible] gradually [illegible] the amount of oxygen to two holes and [illegible] to three especially in long operations

(7) The main guides [illegible] are [illegible]

(a) The colour should not be deeper than a dull pink

(b) The ocular reflexes should show loss of conjunctival reflex but always a faint corneal one at least and moderately dilated pupils

(c) The respiration should be regular and full with not more than a gentle snoring and the pulse is usually rather full and accelerated

CLASSIFICATION OF OPERATIONS PERFORMED

Circumcision and slit prepuce	105
Hæmorrhoids &c	71
Abdominal operations	6
Hernias	11
Amputations	23
Varicocele	10
Hydrocele	8
Bubo	29
Abscess	55
Knees	7
Empyema	7
Manipulations	1
Hæmorrhoids &c	6
Cysts and tumours	11
Dental	3
Meatotomy	15
Varicose veins	6
Ruptured bladder	2
Various	102
Total	487

RECORD OF COST OF USE OF ANÆSTHETICS (ANTHOXYLAN)

Cost of nitrous oxide per cylinder 7s
Cost of oxygen per cylinder 3s 9d

Number of operations	Number of minutes	Number of cylinders N_2O	Number of cylinders Oxygen	Total cost	Cost per minute (approx)
504	14,618	153	30	£60 2s 3d	5s

Note.—The nitrous oxide cylinders vary very much indeed in the amount of gas they contain and whereas a good one will last for 100 to 120 minutes or

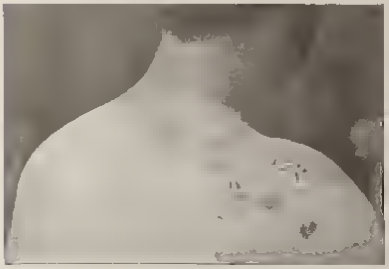
more [illegible] for 20 minutes or less. [illegible] used is not [illegible] would [illegible] difficult to measure, but a slight [illegible] is found for the [illegible] estimate. It is not relatively expensive, [illegible] cost 2s. [illegible] roughly.

HERPES ZOSTER—A NOTE

BY SURGEON COMMANDER W. R. D. BELTON, R.N.

I [illegible] to Surgeon Commander Murray P. Jones, for permission to [illegible] of an unusual case of herpes zoster involving, presumably, [illegible] of the first dorsal posterior root ganglion.

[illegible] rather fascinating pathological curiosity, especially [illegible] of its aetiology. I have often noticed that incidence [illegible] stress of domestic circumstance. In the case under con[illegible] following note was made:—



B. R., 21. A.B. Parents but not written to him for three weeks; this [illegible] worried him considerably and he had just before reporting, sick written to his mother to say that if she would not write to him, he would finish with them. No history of previous attack; no prodromata and no febrile or other symptoms. Rash on the sixth day.

A case of herpes zoster involving the gluteal region came under my observation some years ago. In this case the distribution was very nearly identical and [illegible] stress was obtained on each of the three or four occasions [illegible] under my care.

The whole question of causation is still very controversial; a reference to the medical literature will verify.

[illegible] leans to [illegible] his view [illegible] the experimental [illegible]

The note and its [illegible] of rare cases that have come [illegible]

A CASE OF VON RECKLINGHAUSEN'S DISEASE

By [illegible]

A little note on a [illegible] this use that [illegible] under my notice may [illegible] condition and [illegible] Scheme of Compensation.

It should be explained that in [illegible] paid [illegible] placed on the [illegible] attached to the [illegible] receipt of half their pay and bonuses [illegible] by their own medical practitioners [illegible]

A powerfully built man 48 years [illegible] surgery as limping, stumbled his [illegible] extremities to the disorder [illegible] detected beneath the outer border of the left [illegible]

(*[illegible]*)

[illegible] conflict his arm [illegible] whereas the [illegible] of injuries of a [illegible]

[illegible] applied and the [illegible]

[illegible] It was then [illegible] abdominal wall [illegible] things from the [illegible] employed [illegible] Ship

Examination [illegible] led numerous [illegible] hazel nut to a [illegible] scattered throughout the [illegible] substance of the superficial fascia. The [illegible] all patches of brownish pigmentation on the skin of the [illegible]

Although physically an exceptionally [illegible] nevertheless a very neurotic subject and suspicion [illegible]

It is significant that the lesions [illegible] the regions which had suffered injury.

Von Recklinghausen and other [illegible] contributory factor in the formation of these multiple tumours [illegible] in the case that we have seen is sufficiently strong to warrant the present [illegible] the benefit of the doubt.

It will be seen that this [illegible] prescribing some liberality of assessment when the man puts in his claim for compensation, provided of course the medical officer [illegible] that he is [illegible] handicapped in the industrial market.

AN UNUSUAL CASE OF INJURY TO THE BACK

BY SURGEON LIEUTENANT-COMMANDER [illegible] DEFTIS OBE RN

C C [illegible] aged 21 [illegible] the sick bay on September 20 1921 complaining of a swelling over the lower part of his back which he said he had first noticed two days previously. He had been playing football on September 13 and [illegible] the swelling in the [illegible] by two or more other players whilst [illegible] the act of kicking the ball [illegible] score a goal.

He felt something give [illegible] his body being twisted [illegible] kicking at the ball [illegible] the game and did not [illegible] any further effects until the [illegible] days afterwards.

On examination he was found to have a [illegible] fluctuating swelling in the centre line of the back over the junction of the [illegible] and sacral vertebræ.

The circumference of the swelling [illegible] larger than that of a five shilling piece and it formed a marked prominence over the spine as can be seen in the accompanying photographs.

There was no discoloration of the skin over it, and none came out subsequently.

There was only slight tenderness on palpation but pain was caused by stretching the deep spinal muscles and ligaments on bending forwards.

During the following two days the swelling decreased somewhat in size, and on September 22 the upper border of the sacrum could be felt on palpation. It was noticed however that the ridge of bone seemed to be rather more prominent than is usually so in a normal back. There being no x ray installation on board it was decided to send the case to hospital so that a skiagram might be taken and the diagnosis made certain.

The size and appearance of the swelling were unusual but as the man was able to walk and move about freely there was nothing to indicate any serious injury to the spinal column, and the opinion was arrived at that it was due to

one of the [illegible] having been partially torn at the time of the accident with injury [illegible] of vessel which had subsequently bled and caused the formation of [illegible] diffuse hæmatoma

He was [illegible] to R N Hospital at Haslar on September 23 with the pr[illegible] of hæmatoma of back This subsequently was confirmed [illegible] by report on the case which was at the same time asked for [illegible] abnormality to the spine could be detected

He returned on board to duty on October 7 when all trace of the swelling had disappeared the effusion having been absorbed spontaneously, and no pain or stiffness, or any after ill effects, have since been noticed

The case is recorded as being of interest on account of its somewhat unusual occurrence and the following points about it seem worth noting —

(1) The length of time which elapsed before any signs of the swelling appeared, the injury being sustained on September 13 and no symptoms occurring until the 18th test—five days afterwards—when the swelling came up all at once in the course of a day

(2) The absence of any bruising or signs of external injury, i.e the hæmatoma was deep seated and was produced by suddenly twisting the body not by any direct violence when the man was charged

(3) The absence of any acute pain, and the comparative freedom of movement present in the spine even after the hæmatoma had formed

I am indebted to Sick Berth P O E Adcock for taking the photographs which illustrate the case

[illegible] ELECTRIC LAMP ATTACHMENT

[illegible] E D RUTHERFORD M B R N

[illegible] of a small electric light attachment to [illegible] the [illegible] as used in the Service It will I think be found [illegible] strip on occasions when the usual sliding examination lamp [illegible] available and has the advantage of being easily and cheaply made The [illegible] R A will be able to turn it out with the help of a few additional requirements

It consists of a small dome of metal (personally I made use of the top of a discarded bicycle bell) large enough to just fit over the funnel part of the auroscope and maintained in position by three grub screws placed at equidistant points round its circumference A circular plate of ruby mica or ebonite is fitted at the

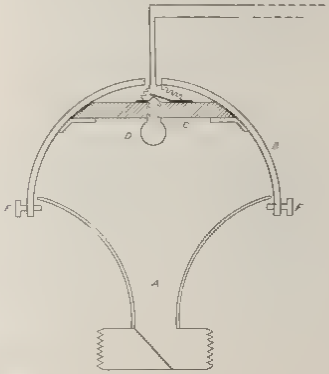


Diagram [illegible] electric light attachment for auroscope *A* Funnel of auroscope *B* metal dome [illegible] lamp *D* leads to dry cell (or a cumulator) and wires *E* screws holding a [illegible] plate

top of the dome and standing about ½ to ¾ inch downwards it is fixed by a couple of strips of metal soldered to the inside of dome In the centre of this plate is fixed a small electric lamp such as is used in pocket torches the screw in socket being let into the plate so that if the bulb burns out it may be easily replaced At the back of the plate a small spring contact is fitted for the central terminal of lamp to which one of the insulated leads is fixed The other lead is fixed to the socket portion of the lamp Insulated leads are taken through a hole

[illegible] the dome to a small dry cell or accumulator with a convenient [illegible] switch in the circuit. The dry cell and switch can be fixed on a shelf or fitted with a hook to hang on any convenient projection on a bulkhead, leaving both hands free for the manipulation of lamp.

A CASE OF FÆCAL FISTULA

By Surgeon Commander H. M. Braithwaite, M.D., R.N.

J. A. S., able seaman reported sick in November, 1917, with pain in the left lumbar region, and was sent to the Royal Naval Hospital, Chatham, in December of that year. A large abscess developed and was opened just anterior to the left erector spinæ muscle about halfway between the last rib and the crest of the ilium in February, 1918. It was described as a perinephric abscess. X-ray photographs showed no abnormality in the spine or ribs or ilium.

Cystoscopic examination showed the right ureter normal, left doubtful.

The abscess was drained and it healed. Patient went to duty in May, 1918, and remained quite well till November, 1919. Then he began to have pain again in the same position, an abscess developed and burst through the old scar. He was in Canada at the time, and was sent to a military hospital, Halifax, on November 19, 1919. The only note of his stay there is dated November 26, 1919: "Sinus has become enlarged and the discharge is fæcal."

Operation.—Sinus explored, found to extend up and down beyond reach of finger; fistula of bowel not found. He was sent to England, and arrived at Royal Naval Hospital, Chatham, on April 2, 1920.

On admission there was a large sinus in the left lumbar region through which came much pus and fæces. No fæces were being passed through anus. His general health was poor; he was rather anæmic and weak. Temperature and pulse normal, urine normal. He was also found to have chronic suppurative otitis media, dating from childhood. No other abnormality found on general examination.

The treatment adopted consisted of frequent douching, an enema every day and tonics.

April 9, 1920. Cystoscopic examination showed urine spurting from both ureters.

It was intended to have a series of skiagrams taken with a barium meal on the next day, but the patient was too ill after the cystoscopy.

April 23, 1920. Skiagrams of the lumbar spine, the left lower ribs, and iliac bone showed "Lipping of the twelfth thoracic and first lumbar vertebræ and a shadow in the left kidney area suggestive of tubercle of the lower pole. Iliac bone normal."

On May 1 the patient underwent his third operation, the sinus being opened up and drainage tubes inserted by Surgeon Captain Rodd. The Carrell Dakin method of treatment of the sinus was begun. Some fæces were passed *per anum* with the daily enema, but much more came through the sinus, together with pus and sometimes enema fluid. Patient's condition seemed to grow worse. His temperature rose regularly every evening to about 102° F.

July 12, 1920. Fourth operation. Surgeon Captain Rodd again explored the sinus and opened it widely, inserting a large drainage tube down into the left iliac fossa. Patient much better after this.

When I took him over again in August, 1920, I found that fæces came from the upper end of the sinus and pus from the lower end, *i.e.* from the left iliac fossa. Skiagram and a barium meal on August 15, showed a shadow outside the bowel at the upper end of the descending colon after twenty-nine hours.

[illegible] Commander Braithwaite The fistul[illegible] [illegible] It was the size of [illegible] [illegible] opening was made at the [illegible] the left exterior superior spin[illegible] [illegible] opening The sutures in the [illegible] number of the fistula was as bad as ever [illegible] August 15 showed the transverse colon [illegible] to the pelvic colon suggesting, in [illegible] failed, this was done

[illegible] on Commander Braithwaite The [illegible] was sealed over with a collodion [illegible] through the sheath of the left rectus [illegible] the wound cleaned and divided [illegible] transverse colon was cut brought [illegible] sutured and invaginated [illegible] the distal end of the pelvic colon

[illegible] the [illegible] omentum were repaired and the latter [illegible] the [illegible]

The [illegible] healed [illegible] the bowels were opened on the fifth morning [illegible] the operation

After [illegible] the short circuited bowel through the fistula and the sutures [illegible] opening It was astonishing how [illegible] bowel The last fragment was seen on April [illegible] 1921 About [illegible] the first of a series of attacks of right renal colic [illegible]

The patient was at the [illegible] in the recreation room when he was suddenly seized with acute [illegible] right side of the abdomen I will not describe the details of all [illegible] subsequent attacks this communicating death more especially [illegible] On December 9 1920, the patient passed three smooth oval calculi [illegible] and on April 12 1921 another one larger about ½ inch by ¼ inch

His condition improved very [illegible] bowels opened naturally pus from sinus diminished From the first [illegible] in slowly diminishing quantities

Now I decided to try and remove the blind piece of gut

April 22 1921 Second operation [illegible] incision through left rectus sheath again The descending colon was separated for [illegible] below upwards but only six inches of it were removed [illegible] up to about [illegible] on the fistula The wound healed by first intention

The lower end of the [illegible] was by now quite clean but it would not heal

June 3 1921 Eighth operation Lower end of sinus shut up for about three inches from the counter incision in the left iliac fossa, in the hope that healing from the bottom would be promoted This manœuvre succeeded slowly In three months the sinus was closed

There was left a cutaneous opening in the left lumbar region through which a small and gradually diminishing amount of pus was discharged from the short circuited bowel After consultation it was decided not to attempt removal of this since the disability was so little only a teaspoonful of mucus actually coming away and the risk not small The patient had been up and about and working in the ward for months He was invalided on August 10 1921 and discharged to his home October 24 1921

[illegible] BRITACK [illegible] IN ORIGIN

[illegible] M A HOLMES [illegible]

[illegible] solely [illegible] spanning a [illegible] distance [illegible] patient did [illegible] who [illegible] vn to [illegible] up [illegible] Sick [illegible]

[illegible] He was [illegible] The [illegible] normal [illegible] He was [illegible] the ribs [illegible] tory of [illegible]

He was admitted to [illegible] Chatham at about [illegible] on October 13 [illegible]

CONDITION ON ADMISSION —He appeared to have a moderate amount of pain [illegible] the left hypochondrium and epigastric regions He was quite conscious colour was good no [illegible] no air hunger, no dilatation of pupils Temperature 97 4°F and [illegible]

The abdomen looked [illegible] the abdominal walls moved freely on respiration, and there was no [illegible] of the abdominal muscles on palpation Slight ecchymosis was present [illegible] the right and left hypochondriac regions There was tenderness [illegible] generally in the left axillary lines The seventh eighth and ninth ribs were felt to be fractured on the left side He voided urine naturally the extravasation which was as follows —

Specific gravity 1012 Reaction [illegible] and Albumin a slight cloud Blood and bile tests negative Microscopic occasional calcium oxalate crystal seen

TREATMENT —Bed [illegible] small quantities of milk injection hypodermic morphia gr [illegible] hot fomentations [illegible] over abdominal wall

The PROGRESS of the case is [illegible] follows —

October 14 —No change [illegible] condition He only complained of general abdominal discomfort [illegible] of [illegible] inability to get his bowels to act normally Temperature morning 101 5 F pulse 80 evening 101 2 F pulse 84

October 15 —The [illegible] was [illegible] intended but not [illegible] with no visible [illegible] of [illegible] A turpentine enema was administered the result of which was a [illegible] motion normal in colour and accompanied by much flatus Temperature morning 100 8 F pulse 100 evening 101 8° F, pulse 98

October 16 —He vomited several times the vomited matter resembled coffee grounds This continued no blood cells microscopically but the presence of blood was shown by chemical test The abdomen was less distended Temperature morning 98 4 F pulse 96 evening 100 F pulse 100

October 17 —In the afternoon he vomited a considerable amount of bilious material which at no time was stercoraceous His stomach was then washed out with hot boric lotion through a stomach tube after which the patient felt more comfortable and looked better but the improvement was only temporary and his abdomen became very distended again in spite of two injections of pituitrin (½ c c in each) small repeated doses of calomel, &c Temperature morning 96 8° F, pulse 100 evening 96 8 F, pulse 100

On [illegible] perature was 100° F the pulse [illegible] 120 to 128, [illegible] It was therefore decided to [illegible]

On [illegible] Caskell and Surgeon Commander J McA Hob[illegible] gen (Surgeon Commander Smith) A right [illegible] was made, and another towards from its [illegible] The transverse colon enormously [illegible] On this being pushed aside blood stained [illegible] the bottom of Winslow The patient non [illegible] was inserted and packed [illegible] closed The patient did not recover [illegible] after reaching the ward in spite of the [illegible]

[illegible] following day by Surgeon Commander [illegible] that both small and large intestines [illegible] was present [illegible] No ulceration of the mucous [illegible] surface was normal *Liver*—Rather [illegible] was present [illegible] of the peritoneum this organ was found [illegible] and had not blood stained fluid The [illegible] and necrotic Dead white [illegible] the lobules [illegible] found in section No other [illegible]

[illegible] The left kidney was very small [illegible] the cortex and medulla [illegible] about 1 in thick the whole mass [illegible] The fat was of much in nei [illegible] side was adherent to the kidney [illegible] Blood was present in the peritoneal [illegible]

[illegible] eighth [illegible] on the left side were fractured [illegible] pathologically [illegible] *Lungs*—These were congested at [illegible]

[illegible] ON THE [illegible] KIDNEY by Surgeon [illegible] normal connective tissue to [illegible] which the cells of the [illegible] stain well and presented [illegible] but there was no definite zone of [illegible]

[illegible] [illegible] all slides presented the usual appearances [illegible]

Pa[illegible] [illegible] of previous fibrotic changes

Coroner [illegible] Verdict Death from an injury to the pan[illegible]

REMARKS—[illegible] of pelvic tumor finally from its [illegible] tolerately rare disease [illegible] the [illegible] still in fact extremely [illegible] Surgery state Injury does [illegible] but a few cases are on record

Second [illegible] aspect I am sure [illegible] the diagnosis was a real [illegible] this patient was comes [illegible] signs of [illegible] immediately on an [illegible] turns to the [illegible] which might give me [illegible]

[illegible] of the solid viscera [illegible]

[illegible] the hollow viscera the most [illegible] from an injury such as a [illegible] abdominal [illegible] at the duodenal [illegible]

On [illegible] a fracture of three ribs [illegible] he had something [illegible] was nothing [illegible] of trouble [illegible] for practical [illegible] with water there—no coil [illegible] dilatation [illegible] of the pulse and [illegible] pulse rate and not gradually [illegible]

The right [illegible] of his abdominal wall was [illegible] only the ribs being [illegible] where several of the muscles are attached

As he fell [illegible] kidney was [illegible] to be injured and further [illegible] no [illegible] dullness in the flanks

Again I felt certain there could be no rupture of the [illegible] tissue I excluded any [illegible] the urinary bladder by the fact that the patient was able to pass his urine [illegible] and [illegible] the urine was found to be free from blood [illegible] the absence of marked shock of tenderness of the abdomen of bulging of an increasing pulse of liver dullness—so of all the typical signs of ruptured intestine—made me think there was no perforation of the hollow organs of the intestinal tract [illegible] bilious vomiting but the partial ileus he had was quite for that

The third and most important reason for publishing this case is the great practical lesson to be learnt from it, and that is when a patient is seen presenting acute abdominal symptoms which do not fit in with those associated with the acute abdomen think of acute hæmorrhagic pancreatitis And accordingly act promptly [illegible] but it is rare disease but it does occur

This is my third experience of acute hæmorrhagic pancreatitis The first occasion was during my first examination in medicine when a catechism combined with the pathology of fat necrosis assumed terrifying proportions a case can be well imagined

The next occasion I met with the disease was when acting as House Surgeon in the Royal Victoria Hospital Newcastle The patient in this case was an elderly female with signs and symptoms suggestive of acute cholecystitis followed by gall stones On opening the abdomen the shining crystalline areas characteristic of fat necrosis were seen in the omentum The *post mortem* confirmed the diagnosis of acute pancreatitis

Supposing a surgeon's suspicions fall on the pancreas a very simple and useful aid in diagnosis is Loewe's adrenalin mydriasis test this depends on the fact that adrenalin has no action on the pupil of the healthy individual, but in certain pathological conditions, it causes dilatation of the pupil which has been claimed to be pathognomonic of pancreatic insufficiency

The test is carried out as follows The size of the patient's pupils and their power of reaction to light are noted Two drops of 1 in 1,000 adrenalin solution are instilled into one conjunctival sac and the procedure is repeated at the end of five minutes the other eye being used as a control If at the end of half an hour dilatation of the pupil has occurred it indicates that there is some pathological or traumatic lesion of the pancreas

I would that someone with the pen of a much readier writer than I were describing this case, as I feel I have not done it justice The publication however, may act as a warning to other naval surgeons not to tarry in exploring the lesser sac and the pancreas lying behind it should they meet with a case similar to the one I have endeavoured to describe

Reviews.

[illegible] THE STOMACH [illegible] London H K [illegible]

[illegible] seven chapters The first [illegible] with gastric ulcer the second with the [illegible] and the third with the complications and [illegible] of duodenal ulcer the book with stenosis of the pylorus with carcinoma of the stomach The writer [illegible] authority on the subject has also an experienced surgeon

[illegible] book of the greatest value full of the very latest ideas [illegible] recommended to every medical man especially at the [illegible] duodenal ulcers appear to be so prevalent

[illegible] MENTAL AND NERVOUS PRACTICE By W Ford [illegible] Edinburgh E and S [illegible] 1921 Pp xi + 278 Price 15s net

[illegible] first of its kind since the issue of "Vaccine [illegible] W Allen It is the result of many years research [illegible] with those of other workers The first [illegible] pure bacteriology and its methods as an [illegible] A strong case is made out against [illegible] and focal disorders which in the [illegible] vaccine treatment if clinically worked

[illegible] dealt firstly with that dealing with bacterial [illegible] infective diseases [illegible] practically no condition is left out that is [illegible]

[illegible] mental disorders under the acute insanities, manic [illegible] dementia praecox are very enlightening In the first of [illegible] diphtheroid bacilli are considered the important infective [illegible] along with *Streptococcus pyogenes* and *S faecalis* [illegible] and *B influenzae* are found in the second In [illegible] has not found it easy to locate a special bacterial [illegible] definite evidence to divide it into three types of [illegible] diphtheroid bacilli by pneumococci and by the [illegible] streptococci of the intestines

[illegible] to illustrate all three types of insanity [illegible] and readily and form a distinct encouragement [illegible] this form of treatment

[illegible] SURGERY By John Lanham Binnie A M C M Aber [illegible] Kansas City Mo Eighth Edition Revised and enlarged [illegible] number of illustrations printed in colours London [illegible] 1921 Pp xvii 1311 Price £3 3s net

[illegible] well known work has been brought thoroughly up [illegible] abdominal and plastic surgery [illegible] surgical operation of which he has had little

experience [illegible]
of the [illegible]
but omit [illegible]
every open [illegible]
Not that [illegible]
some special [illegible]

In the [illegible]
is one [illegible]
those procedure [illegible]
on general surgery [illegible]
— much greater [illegible]
many of lar[illegible]
everyone

This prefa[illegible]
you will and [illegible]
index absolutely [illegible]
surgery and the [illegible]
ought to be here [illegible]
a few lines or [illegible]
other words there [illegible] graphy [illegible]
these subjects [illegible]

A good point [illegible] of the [illegible]
authorities on [illegible]

A bad point is [illegible]
practical notes [illegible] of the [illegible]
each operation [illegible]
hast Also [illegible]
to encounter [illegible]
operative surgeon [illegible]
be forewarned of these little [illegible]
shall deal with them

On the whole [illegible]
of every [illegible] surgery

Clinical Surgical Diagnosis [illegible]
de Quervain Third English Edition [illegible]
by J Shomburg M D [illegible]
1921 Pp xii [illegible] 411 with [illegible]

The author who has since [illegible]
of the Surgical Clinic at the [illegible]
teaching The book is well [illegible]

It is divided into [illegible]
diagnosis following investigations on [illegible]
to the author's [illegible] special [illegible]
accurate diagnosis [illegible] endeavours to [illegible]
patient [illegible] the [illegible]
operation [illegible] of diagnosis [illegible]

The regional [illegible] makes the [illegible]
described [illegible] from the [illegible]
brief For example the [illegible] of to [illegible]
cerebral localization [illegible] but [illegible]
general surgical diagnosis [illegible]
if he could find [illegible] special subject [illegible]
monographs so that [illegible] particular [illegible]
to the fullest extent available at present [illegible]

[illegible] translation

THE DICTIONNAIRE PRATIQUE DE MÉDECINE [illegible] edited by Dr. M. Morel [illegible] Paris: [illegible] about 600 pages [illegible] With 12 [illegible] London and New York: [illegible] 1891. Price £0 [illegible]

This [illegible] contains [illegible] the [illegible] individuals [illegible] Well [illegible] exceed beyond [illegible] its [illegible] gastronomic [illegible]

[illegible] of course [illegible] fortunate possessor of [illegible] Tractures, [illegible] Bacteria [illegible] wonderful [illegible] Bran [illegible] Dissases [illegible] Sis Psycho [illegible] xix + 446 [illegible]

[illegible] the micro [illegible] that he [illegible] It a [illegible] man of

[illegible]

[illegible] the [illegible]

[illegible] of the [illegible] and [illegible] The [illegible]

[illegible]

[illegible] the states [illegible] of [illegible]

[illegible] under [illegible] manifest [illegible] Though [illegible] leaving it perhaps [illegible] the [illegible] to give the writer [illegible] gnic debate guidance [illegible] he has so successfully [illegible]

Development Factors [illegible] Eugene S. Talbot M.S. Ph.D. M.D. [illegible] Bennett McIntosh Gill [illegible] 1921 Pp. xx + 130 with illustrations [illegible]

Professor Talbot says the purpose [illegible] conceptions of heredity. He thinks [illegible] and development must be taken into [illegible] by intra-uterine elimination and elsewhere [illegible] doubt as to the meaning which the author [illegible] of phylogeny and ontogeny and [illegible] organs constant reference to their [illegible] teeth, jaws and skull as lending [illegible] attention. The book is copiously illustrated [illegible] of a hundred or so of authorities [illegible] of. As [illegible] interesting subject it decidedly [illegible] immediately below the sacrum called the coccyx [illegible] author is writing. We are surprised [illegible] but for [illegible] on the ovaries and testicles, should [illegible] be a most serious [illegible] We can only characterize as nonsense the statement that [illegible] bring about divorce as the existing sexual [illegible] women just before marriage.

[illegible]

[illegible] the best [illegible]

[illegible] faces [illegible]

[illegible] method

[illegible] the

[illegible]

By W. [illegible] Fourth [illegible] illustra-

[illegible]

[illegible] Lots Ilsor[illegible] written from [illegible] point of [illegible] doctrine of psychical [illegible] of [illegible] every action, even [illegible] which [illegible] possibly be executed by [illegible] The author [illegible] psychoanalysts [illegible] has [illegible] this method. Now a psycho[illegible] over the [illegible] to [illegible] separate [illegible] attempt [illegible] probably [illegible] but that the [illegible] require a longer period [illegible] [illegible] to keep the [illegible] that the author has [illegible] psychoanalysts more especially [illegible] with his extraordinary [illegible] exhibits [illegible] practising economy

[illegible] to [illegible] exerting [illegible] sign [illegible] or [illegible]

The [illegible] with [illegible] drug [illegible] while [illegible] sea—he [illegible] retained [illegible] the sole [illegible] logy of [illegible] regarded [illegible] the text [illegible] and anat[illegible] changes [illegible] ly warn [illegible] of psy[illegible] is 'purely [illegible] The [illegible] motion. When [illegible] good [illegible] and if he fails [illegible] take [illegible] such as 'pure [illegible] The [illegible] and psy[illegible] thinking [illegible] and they [illegible] as certain [illegible] matter [illegible] so [illegible] thing of motion apart from [illegible] of life and mind apart [illegible] To all of [illegible] of mechanism [illegible] and [illegible] of a discussion [illegible] Dr Stoddart [illegible] to the *spirituals* [illegible] spread mischief [illegible] by spiritual [illegible] this creed to [illegible] instead of [illegible]

Tangent [illegible] least a [illegible] the author says before the [illegible] was the [illegible] but since the war it [illegible] would be a more appropriate [illegible] no illusion [illegible] ption of things [illegible] chosen [illegible] for the [illegible] nervous disease. The chapter [illegible] has been [illegible] and the general alcoholic [illegible] chapter on alcoholic insanity [illegible] will see [illegible] when he suggests that the Russian [illegible] is a sample [illegible] yet [illegible] of alcohol.

Dr Stoddart [illegible] that [illegible] each one of our [illegible] of neurons in [illegible] introspective of the [illegible] continuity necessitate the [illegible] ments of a stream [illegible] of the steam molecules [illegible] tions and in directions of the elementary cell [illegible] regarded as an analogon [illegible] the inv stuffs out of which the cell protoplasm [illegible] manner in which such apparently inert things [illegible] structure to reset the stored fracture in [illegible] of an element of purposiveness.

The author gives no definition of sensation [illegible] tion is we do not know. This is not very [illegible] definitions even if no [illegible] are essential [illegible] quaint with such a definition as the simplest [illegible] caused by a physical stimulus.

In [illegible] regarded by Dr Stoddart as de[illegible] Nat[illegible] ting the interests of the individ[illegible] of the re[illegible] that of [illegible] to makes the interests of the [illegible] ent to those [illegible] to the tacit sanctionin[illegible] [illegible] encourage [illegible] neuropaths, the net result [illegible] *ural of the*

[illegible] pressions are used somewhat [illegible] For example [illegible] unconscious secretion [illegible] sions cerebra[illegible] [illegible] other expressions contribute [illegible] in terms? One [illegible] nerve impulses produced [illegible] pression by say [illegible] ing which in [illegible] the impulses [illegible] is absorbed in study but [illegible] the feeling [illegible] It all depends on det[illegible] a sensa[illegible] ing or feeling [illegible] is not co[illegible] ly speaking a [illegible]

[illegible] It is su[illegible] ously in a book on mental diseases [illegible] bet to be compelled to limit [illegible] its various type[illegible] a [illegible] feeble physical [illegible] We presume that the [illegible] in page 276 is a [illegible] for [illegible] This [illegible] tidents and [illegible] of [illegible] to [illegible] va[illegible] style will appeal [illegible] to [illegible] on the [illegible] lishers upon the [illegible] of the [illegible] present [illegible]

[illegible] Bacteriaemia and Allied Affections Notes [illegible] Ordinary to [illegible] Medicine [illegible] London [illegible] Sons and [illegible]

[illegible] for 1895 when Lister was 30 [illegible] management which [illegible] the [illegible] to follow the level [illegible]

Prof[illegible] the Treatment of Compound Fractures—rightly [illegible] most to the [illegible] as being the first attempt [illegible] to [illegible] antiseptics [illegible] to [illegible] aseptic [illegible]

A [illegible] life together [illegible] introductory [illegible] volume [illegible] will doubtless cause many to [illegible] the [illegible] (once [illegible] in number) published by the Clarendon [illegible]

We regret the [illegible] oversight this [illegible] was not published in a previous [illegible] of the [illegible]

Religion and Insanity Analysis By Surgeon Lieutenant Commander Robert M [illegible] R.N. (Retired) M.R.C.S. Eng. L.R.C.P. Lond. and Edin. Member of the Medico Analytical Society

This is a reprint in pamphlet form of a lecture delivered by the author in St Paul's Church Cavendish Square, London, and originally published in The Challenge.

In taking religion and our relations to it as a basis the author has brought up their [illegible] of [illegible] and importance to each and all of us. He has contributed some [illegible] of thought in a way that on the one hand does not round

religious susceptibilities on the other hand [illegible] solve perplexities [illegible] new light on a [illegible] which is only just [illegible] understood

For this purpose he [illegible] psychoanalytic [illegible] its lessons [illegible] by no means limited [illegible] he might [illegible] out that just as physiology [illegible] and the study of morbid [illegible] so psychology [illegible] to their application [illegible]

It is questionable whether [illegible] all human maladies as a material [illegible] able to understand our own nature and [illegible] is now possible and in the direction in which [illegible]

His lecture is a great pleasure [illegible] right and best sense of the word

The author will gladly send copies [illegible] readers who wish for one on receipt of a stamped [illegible] 31, Wimpole Street, London, W.1

MATERIA MEDICA AND THERAPEUTICS a [illegible] treatment of diseases By J Mitchell Bruce M.A. M.D. [illegible] F.R.C.P. [illegible], and Walter J Dilling M.B., Ch.B. [illegible] London [illegible] Ltd 1921 Pp 678 Price 10s 6d net

The twelfth edition of this work leaves little room [illegible] except that it might be urged that the attempt is made to compress [illegible] information into one volume The details given are brief and necessitate [illegible] us to note that although nearly four pages are devoted to pills and [illegible] compressed tablets which feature so largely in modern [illegible] not mentioned

The general arrangements of the work the method of [illegible] and the selection of details render it a valuable book [illegible] both the student and medical practitioner but it deals with too many subjects for it to be considered in the light of a text book

News of the Service

BIRTH

[illegible]

OBITUARY

[illegible]

HONOURS

[illegible]

PROMOTIONS

[illegible]

[illegible] *of the* [illegible]

[illegible] Goss DEL BA [illegible]

[illegible] Neale M.B. [illegible]

[illegible] Murphy M.B. BA [illegible]

ADMIRALTY ORDERS ISSUED FROM SEPTEMBER 23 TO NOVEMBER 18 1921

(Only the issue Admiralty Orders pertaining directly to the duties of the Medical Officers affected and not confidential are included.)

3160.—Court Martial Procedure

(N.L. 1810.—24.9.1921.)

Evidence of Medical Officers.

14. With reference to Kings Regulations and Admiralty Instructions, Vol. 691a, the Admiralty have had under consideration the question of the position of Naval Medical Officers giving evidence at Courts Martial or Courts of Inquiry. In their Lordships opinion Naval Officers find difficulty in the Service and in many cases inquiry has to be delayed until alternative Medical Officers have been appointed. There is however that relief from this may be left to the Medical Officer himself. He must be the best judge of the relative importance of his presence at the inquiry or trial and should be guided by the nature of the trial or inquiry, the Officer presiding, the President of the Court and the obligation he owes to

15. When a Medical Officer has been directed to examine an Officer or man, he should take the Officer's case, or the case of a rating in the same manner as he would take any other case.

3526.—Submarines—Medical Fitness of Volunteers.

(N.L. 1941.—28.10.1921.)

In future all Medical Officers of Captain's Commands will not be necessary to the Medical Officer for Submarines for submission at the end of Form S.S.8 [illegible] (Submarine).

12. Previously [illegible] Medical Officer [illegible] report.

(3) [illegible] Medical Officers are to be informed that [illegible] from the [illegible] Medical Officers [illegible] plus

(M.O.a 1956/20 and 1920/20—N.L. 1630/21.)

3610.—Lizimentine Terebilthine Stocks until for Use

(M.D.G. 9055/21.—1.11.1921.)

It has been ascertained that the Lizimentine Terebilthine supplied prior to September 1920 for use in Torpedo Boat Destroyer and Torpedo Boat Medical boxes is now unfit for use.

All remaining stocks of the present (Pattern) [illegible] H.M. Ships and Establishments which Torpedo Boat Destroyer and Torpedo Boat Chests have been supplied are to be [illegible] and to which the Medical Chests are referred to Hospital.

Medical Officers Superintending Dispensaries and Pharmacies are to be informed that the stocks of the above preparation are to be disposed of as soon as possible, and will draw from Hospital Stores Office Stores [illegible] immediately [illegible] before September 20 1920 [illegible] to obtain [illegible]

The [illegible] stocks are to be released pending the issue of instructions as to disposal.

3729.—Medical Department, Admiralty—Address

(M.D.G. 9221/21.—11.11.1921.)

The address of the Medical Department of the Admiralty is 68 Victoria Street, S.W.1 from Wednesday, November 9 1921. Telephone Number will be notified when known.

3841.—Medical Department—Telephone Number

(M.D.G. 9221/21.—12.11.1921.)

The telephone number of the Medical Department of the Admiralty in Victoria Street is Victoria 27 [illegible]

(A.F.O. 3729/21.)

3750.—Appointments—Officers

(C. W. 16160/21.—18.11.1921.)

[illegible] in the Admiralty to have [illegible]

[illegible] are not to [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

3752.—Disabled and Deceased Officers and Men—Medical Reports

(C. W. 16258/15.11.1921.)

Medical Officers are not to communicate to disabled Officers or men [illegible] deceased Officers [illegible] to which their disablement or [illegible] aggravated by the Service. This percentage of disablement [illegible] to be [illegible] to official reports.

3753.—Mosquito Proofing

Fascet Glass Cupboards in Chinese Sleeping

(D. 269999/21.—18.11.1921.)

[illegible] extract from a letter from the Commanding Officer H.M.S. [illegible] quoted as follows:—

[illegible] question as to whether consulting [illegible] H.M.S. *Worcester* [illegible] opinion that [illegible] mosquito [illegible] the Chinese [illegible] the glass cupboards were formerly fitted with [illegible] insect [illegible] the sick bays [illegible] the exclusion of insects [illegible] H.M.S. *Zaiad* this should be kept [illegible] Glass will be considered [illegible]

[illegible] next [illegible] months unless should be reported [illegible]

(Reg. 31/8/1.N.—1061.)

Notices.

The Editors invite Medical Officers to send in Original Papers on professional subjects travel personal experiences &c. Items of news and matters of interest to the Naval Medical Service will be welcomed from ships and establishments on home and foreign stations.

All Articles or Communications published in the Journal of the Royal Naval Medical Service will become the property of the Journal with full copyright powers, unless the author declares when sending the Article that he desires to reserve the copyright to himself.

Notices of Births Marriages and Deaths are inserted free of charge to subscribers.

All Communications should reach the Editors on or before the 15th of the month preceding the date of issue. Unless clearly written they should be typed in order to avoid mistakes and they should be addressed to The Editors Journal of the Royal Naval Medical Service Medical Department, Admiralty London.

The Journal of the Royal Naval Medical Service is published quarterly four numbers comprising one volume.

The Subscription is 20s per annum (postage included) payable on January 1 of each year, but should a subscriber wish to commence at another quarter he may do so by payment at the rate of 5s per copy. All Subscriptions are payable in advance. Single copies can be obtained at 6s per copy. Cheques or Postal Orders for Subscriptions should be crossed Cox and Co., and be made payable to The Manager, Journal of the Royal Naval Medical Service Medical Department Admiralty, London, to whom all communications relating to subscriptions, &c. should be addressed.

Vol. [illegible] VIII. Volume [illegible]

Journal

of the

Royal Naval Medical Service.

Original Articles.

THE PROGRESS OF HYGIENE PATHOLOGY AND BACTERIOLOGY IN THE NAVAL MEDICAL SERVICE.[1]

By Surgeon Rear Admiral Sir PERCY BASSETT SMITH, K.C.B., C.M.G., [illegible]

My first words are to thank the Council and Fellows of the Sanitary Group of the Society of Medical Officers of Health for electing me [illegible] as President for the year. I greatly appreciate the honour you have thus conferred upon me, especially as my Fellowship is of such recent date, and that my duties are not really those of a Medical Officer of Health.

The position is the more difficult as my predecessor, Colonel Kenneth [illegible] is so distinguished and so universally looked up to as an ideal President, and so in touch with your all in a way I can never be. After very much thought and consideration it appeared to me it would be better to take [illegible] special subject for my address, but that it would probably interest [illegible] more and be more fitting if I could show the evolution of our present position in the Navy with regard to hygiene, pathology, and bacteriology, with some suggestions for the future.

Picture to yourselves the good old days of 1692, when Naval surgeons were appointed in the Naval Medical Service, at first as [illegible] men. How in 1701 surgeons in ships were rated with commanders and [illegible] with pilots, gunners and carpenters. Even then they were rated [illegible] is inferior, and allowed is a little to mess with warrant officers. A century later, 1808, the senior medical officer alone was allowed [illegible] a cabin and mess in the wardroom. He then used to wear [illegible] frock coat and a tall hat, a dress one would think most inappropriate for

[1] The Presidential Address to the Sanitary Group of the Medical Officers of Health Society, [illegible]

Under these circumstances [illegible] standard of efficiency was not [illegible] one was not of much [illegible]

[illegible] pioneers in hygiene and preventive medicine for the Naval Service were Lind and Blane. Dr Lind afterwards Sir [illegible] was Senior Physician of Haslar Hospital (physician ranking [illegible] surgeon in the [illegible] and he received the princely [illegible] a year. His unpublished diaries be famous for the work [illegible] prevention of scurvy but besides that he inaugurated many [illegible] reforms. In the naval wars of that time, Lind states that [illegible] lives in our fleets than the united efforts of French and Spanish arms, reminding us of the experience with typhoid in the Boer War. He recommended the use of lemon juice and sour krout, which however was not officially enforced till forty years after [illegible] to the merits of the Central Admiralty Board. Lind's hygienic reforms included diet, better water, better ventilation and hygienic slop improved clothing for the men and cleanliness. While emphasising the value of fresh air and cleanliness for the prevention of the spreading of infectious diseases, he fully recognized that other means were required to destroy the infecting agents by fumigation with chlorinids, such as sulphur and arsenic, thus anticipating modern methods. His wide range of activities may be gathered from the titles of his two chief books. On the most effectual methods of preserving the health of the seaman and 'An essay on diseases incidental to Europeans in hot climates.' He was described by Trotter as the Father of Nautical Medicine.

Next to Lind as a hygienic reformer in the Navy came Sir Gilbert Blane by whose tact and wisdom many of Lind's recommendations were carried into effect. He worked hard for reform from 1780, when he was Physician to the Fleet until the time of his death in 1834. He strongly supported vaccination against small pox and naval surgeons were directed to inoculate any seamen who were desirous of it and it should be noted that in 1801 eighty nine naval surgeons presented Jenner with a Gold Medal. Vaccination however was not made compulsory in the Royal Navy until 1858. Blane in his time advocated that naval surgeons should be allowed to employ their spare time in private practice and thus increase their professional knowledge—a concession again granted in 1913. His memory is now chiefly associated with the Gehl Medal awarded annually to naval medical officers and which was originally given for the best journals kept by officers afloat, thus encouraging observation and reflecting.

It was in 1827 under the enlightened and advanced views of Sir Wm Burnett at that time Medical Director General that a true advance was made and the idea of instruction for medical officers was promulgated. Mr Scott founded the Pathological Museum at Haslar which received specimens from Malta, Chatham and Greenwich. He was appointed to

[illegible] and [illegible] Dr [illegible] instead of [illegible] the Hospital [illegible] the [illegible] [illegible] instructions recorded concerning the behavior [illegible] They are called "respectable individuals" and are asked to [illegible] the strictest discretion and not to presume to offer any remarks either aloud or by whispering this practice being liable to distract the attention of the lecturer and the audience The title of "Lecturer" disappeared from the Navy List in 1840 and probably lectures and instruction ceased at this same time It was not until 1871 that the instruction of naval surgeons was seriously taken in hand, the newly joined men being then sent to the Army School at Netley In 1881 it was considered that the training of the young medical officers should be given by those with whom they would afterwards be associated, and who were thoroughly conversant with naval requirements and life on board ship A school was therefore started at Haslar Hospital and a small laboratory was equipped there for the practical examination of water, food, and for the study of meteorology Lectures were given on general and naval hygiene examination of food naval construction, general hospital instruction and ambulance drill while post mortem examinations were also made

In 1897 the importance of instruction in Tropical Medicine for all medical officers was pointed out by Sir Patrick Manson, and in 1899 it was decided to revise the educational course of naval medical officers so as to include the study of Tropical Diseases, Bacteriology and Military Surgery In 1900 this was done The course consisted of four months uninterrupted study and included theoretical and practical Hygiene, Tropical Medicine, Bacteriology, Parasitology and Pathology First there was a course for all newly entered surgeons A second course for promotion—at that time to Staff Surgeon of eight to twelve years' service and special encouragement was given by the presentation of medals and by granting accelerated promotion to those who most distinguished themselves An increased importance was placed on post mortem examinations and records Thus a great step forward was made in the study of Hygiene and Preventive Medicine in the Service Very soon it was recognized that much could also be done for the medical officers in the Fleet by holding voluntary courses in the laboratory for senior men who studied but were not examined on the work done The last type of class was a great success, so much so that similar courses were directed to be held at the two other great Naval Hospitals at Plymouth and Chatham Research work was also encouraged by the Admiralty particularly by Lord Salborne who was First Lord He took very great personal interest in the methods for the prevention of Mediterranean fever which was at that time a great source of morbidity in the Fleet Special promotion was given for research and professional merit and enthusiasm thus stimulated Also at this time the importance of Pathology was further recognized by

[illegible] to display [illegible] the [illegible] Sir Andrew [illegible] with [illegible] to [illegible] beautiful [illegible] which are [illegible] the Royal Naval [illegible] the stool [illegible] but [illegible] An [illegible] was [illegible]

[illegible] of the [illegible] fleet away [illegible] A [illegible] of [illegible] the outfit [illegible] up the [illegible] Vessels [illegible] in [illegible] only is his [illegible]

[illegible] was the [illegible] of syphilis [illegible] and [illegible] the Wassermann [illegible] is nearly [illegible] useful [illegible] in [illegible] the [illegible] and this was [illegible] in the [illegible]

[illegible] Commission [illegible] the Sick [illegible] the other [illegible] and instruction [illegible] and [illegible] the laboratory [illegible] staffed [illegible]

[illegible] and submarines [illegible] subject [illegible] the examination [illegible] means [illegible] to constant [illegible] hygiene [illegible]

[illegible] railways [illegible] the [illegible] brushes [illegible] [illegible] —[illegible] plo[illegible]

My [illegible] introduction to bacteriology in the Navy [illegible] Which I attended to a training ship [illegible] Wi[illegible] 1898 on [illegible] the lids came under my [illegible] small [illegible] in the middle of the forehead. Suspicion [illegible] specimen was stained, and [illegible] was communicated and inoculated [illegible] the [illegible] from hours and its blood was full [illegible] bacilli. [illegible] It was found that the [illegible] previously [illegible] up a rabbit which he carried about for [illegible] inquiry [illegible] that a cow which had died probably [illegible] though [illegible] had been found dead in the [illegible] we [illegible] the spores of anthrax had be[illegible] by carbolic [illegible] affected the [illegible] animal [illegible] which had died [illegible] As [illegible] the [illegible] lesson never to be [illegible]

It is [illegible] that most of the cases [illegible] to be cerebro spinal meningitis and anthrax bacilli were abundant and easily demonstrated in the cerebro spinal fluid obtained by lumbar puncture.

Among the bacteriological questions which have [illegible] in the Service is the [illegible] epidemics of gastro intestinal disease attributed to food poisoning. These have been most frequent in large training ships for boys and in [illegible] establishments. Here the Naval Health Officer [illegible] the epidemiological points and the material is sent to the most laboratory for investigation and in some cases the evidence has been [illegible]. A very interesting epidemic occurred some time ago in the Royal Hospital School Greenwich when 127 boys were attacked. The [illegible] was [illegible] the symptoms were in some cases [illegible] there were no deaths. The food was inspected [illegible] and certain [illegible] suspected though nothing definite was [illegible] the samples [illegible] over. *Bacillus enteritidis* (mutton type) was [illegible] in the [illegible] of three of the boys most severely affected and [illegible] agglutinated by the serum of the same boys and by that of [illegible] had been attacked. There was [illegible] of the disease and was probably introduced from the suspected food. At Plymouth an epidemic was traced to [illegible] at the Royal Naval College Osborne. A curious group of [illegible] was [illegible] of a small quantity of potatoes which had [illegible] spirit—sulphur poisoning.

Since the war owing to the work of Charles [illegible] and the Lister Institute [illegible] experimental work has been carried out at Greenwich to find an efficient substitute. [illegible] provided a sufficient [illegible] has been to incorporate fresh lemon juice with [illegible]

[illegible]

[illegible]

[illegible]

[illegible] examples [illegible] intensely [illegible] Surgeon [illegible] Dublin O B [illegible] on the [illegible] the inoculation [illegible] Commander [illegible] Royal [illegible] DSO and [illegible] that the [illegible] and [illegible] men [illegible] time [illegible] men [illegible] paid for such treatment [illegible] and discharge [illegible] inoculations against [illegible] for all in the [illegible] abroad

Evolution has been slow but progressive and in the [illegible] unless the Utopian period of universal disarmament, with [illegible] epoch wipes out the Navy preventive measures will [illegible] reduce the incidence of disease in the Service. The chief [illegible] Navy at the present time are personal training preventive [illegible] disease and tuberculosis The former under existing conditions [illegible] and barrack life is of very great importance and is very [illegible] and fairly well met Very good work has done particularly by [illegible] Commander Digby Bell R N who with the North Sea Fleet [illegible] trying waiting period when it was based at Scapa [illegible] like to see more control than is at present the case in the fleet [illegible] medical officers who have specialized in this subject who are [illegible] the only judges of the condition of the men under training

With regard to tuberculosis [illegible] years past there has been [illegible] ment in the ventilation of ships and better control of the food supply [illegible] had a tendency to limit the incidence but there are still too many cases This must be put down mainly to the lighting [illegible] hood infection brought about by [illegible] epidemic diseases I have seen several fulminating Mediterranean fever and dysentery due to the intense cachexia produced in these diseases while the patients were in hospital The usual result is that all [illegible] tuberculosis must be invalided therefore what becomes of them afterwards interests us from a hygienic point of view

These cases generally become more or less advanced phthisis spitting up abundant T B but cases with no physical signs or only slight positive x ray pictures and tuberculin reactions are present When invalided they go to their own homes are put on full disablement pension which is periodically revised for there is no sanitorium for tubercle in the Navy (there is a great opportunity here for some philanthropists to show their gratitude to the Navy for safeguarding our homes), and the further treatment falls on their friends or the county It was previously the custom when a

patient was discharged from a naval hospital to inform the M.O.H. of the area to which the patient was sent, and he would after receiving the notification see that proper precautions were taken. Now we have to report direct to the Ministry of Health, and they pass it on to the M.O.H. This appears to be a procedure likely to be unhealthy and to be detrimental for the men and their families when returning to a poor home, generally overcrowded and often badly ventilated, before any man is informed of the risk of disseminating the disease, and what to do.

From now we all recognize that one duty is to prevent the men being invalided as tuberculous, but to do this we must be able, at one second to relieve the should they unfortunately be employing, all known chemical and bacteriological methods to compare to diagnosis and to antagonize the morbid agent or agents.

Although the science of Preventive Medicine has advanced far in the Navy Service, I look forward to the time when the work will be put on a definite basis by the introduction of a chair in the lines of that now established in the Army Medical Service, namely, that the Professors at Haslar shall be the Regius Chair of Surgeon Captain (which has been is very equivocal title to a naval person) and be given a naval special allowance, for as the responsibility is great it should be officially recognized, and they should be respectively Director of Hygiene and Pathologist, and have an efficient understudy training to take his place when he is ill. Each should be responsible to the Medical Director General for the special work at all naval establishments throughout the country, and they should inspect their efficiency of personnel and apparatus. All reports should be sent in from the laboratories to them so that comparative and statistical results would be compatible. Each laboratory in a large hospital should have a trained specialist who would be able to give time to the work, and these specialists should be called in by the Director without prejudice as to rank or seniority if then skilled men.

All steps should be taken to provide at one great naval centres, and the appointed Public Health officers will have form of very great assistance in the development of that institution, for is the culmination of work so necessary for the public health of the Services and the civil officers on shore.

Surgeon Commander T. Mitchell-Thomson, R.N., President of the local Public Health Committee, and one of the Sanitary officers in which he has been the work of the last years. The officers will be of the Medical Department, especially of municipal and sanitary matters, will be given leave of absence to the Ministry of Health, in cooperation with officers of the War Office, Admiralty, Home Office, and Ministry of Health. The appointment of Surgeon Commander Bond now at Greenwich, as consultant specially in the Public Health problems, as adviser to the Admiralty.

[illegible] ated with all [illegible] officers [illegible] Navy in [illegible] at Hasha, then [illegible] which since [illegible] have within the [illegible] tested the zeal [illegible] some of the [illegible] my day is [illegible] still on any [illegible] possible.

The [illegible] time is very [illegible] but as years go by the [illegible] *for facts* from the bacteriologist on [illegible] more and more marked.

The aphorism the fallacy of finality [illegible] There is *no finality*. A fact discovered [illegible] only stimulate to further investigation [illegible] the wise words of Confucius the greatest [illegible] 500 B.C. that "Learning without thought [illegible] learning is perilous."

SOME NOTES ON EARLY ATTEMPTS AT THE PROPHYLAXIS AGAINST COAST FEVERS ON THE WEST AFRICAN COAST.

By [illegible] Surgeon-Captain [illegible] R.N.V.R., [illegible] R.H.S. [illegible]

In a small ship of the sort [illegible] a rule little medical work to [illegible] prophylaxis. It would be perhaps a presumption on [illegible] one year's active study of the subject to lay down the law [illegible] methods of guarding against [illegible] diseases [illegible] tempted through the discovery [illegible] ceedings to write a few notes [illegible] officers experienced on this station and [illegible] to cope with them.

This Coast is certainly the fever [illegible] is practically the history of malaria [illegible] sible to write a history of the [illegible] Coast or of the Coast without [illegible] graph. And almost all our only medical [illegible] the Coast [illegible] white men ashore were few and far between [illegible] naval medical officer and commanding [illegible] the Bight Division which a hundred years [illegible] squadron maintained for the suppression of the slave trade.

The journals which we have [illegible] the records of the

[illegible] man about the [illegible] ship life [illegible] on the [illegible] youth [illegible]

[illegible] H M S [illegible] forty [illegible] 108 within [illegible] in the [illegible]

[illegible] much [illegible] Sir Ronald Ross [illegible] case bearing [illegible] seem an [illegible] Hippocrates [illegible] malaria and [illegible] Varro in [illegible] expressed [illegible] the cause [illegible] in their [illegible] seem [illegible] —the real [illegible] the [illegible] fever

[illegible] necessary very much [illegible] possible it was [illegible] they [illegible] the real [illegible]

[illegible] H G [illegible] of H M S [illegible] on [illegible] An [illegible] civilian who [illegible] for [illegible] the same [illegible] and that [illegible] called [illegible] yellow fever without his [illegible] much [illegible]

[illegible] of the early nineties in which [illegible] intermittent [illegible] of which would [illegible] from the [illegible] of yellow fever

[illegible] by the [illegible] entries of punishments in [illegible] appear [illegible] filled in the [illegible] Mr [illegible] Sawyer and Benjamin All [illegible] appointments with [illegible] times and [illegible] they have been doing well

[illegible] tragedies is not [illegible] the [illegible] bring party [illegible] after having [illegible] to death, managed [illegible] the barracks of the [illegible] with all the clothing of the [illegible] consisted only of a thatched roof [illegible] degrees from the [illegible] very expensive though none [illegible] less

[illegible] prev[illegible] [illegible] [illegible] [

[illegible] the lingoon kept by th[illegible] and stinking to their spirits [illegible]

[illegible] seem to have realized how [illegible] is to differentiate between [illegible] were treated on much the [illegible]

[illegible] acted unmeritorously [illegible] w[illegible] f[illegible] use at all other [illegible]

[illegible] M. Sleep *Bleathwood* wl[illegible] on the Coast mostly on [illegible] says. After the exp[illegible] [illegible] inclined to believe that [illegible] inner ton arbitr[illegible] between [illegible] of the [illegible] practicable is I [illegible] practical purposes a distr[illegible]

[illegible] nothing yet is [illegible] that [illegible] the Coast which [illegible] the European [illegible] mass of symptoms [illegible]

[illegible] the name of this [illegible]

[illegible] the primitive of [illegible] Of the pre[illegible] [illegible] would be [illegible] commercial [illegible] opposed to [illegible] examined [illegible] dispatched [illegible] in the [illegible] — partly [illegible] seen—a [illegible] on the [illegible] most [illegible]

[illegible] two [illegible] the [illegible]

[illegible]

[illegible] *Journal* [illegible] H M S *Trident*

An illuminating story expressing the strong op[illegible] faculty on the other side is told in the Journal of a [illegible] the Report of the Yellow Fever Commission —

The frequent deaths he says produced such a [illegible] that at meal hours when smiling was illegal [illegible] the evening, the men used to [illegible] then hers to learn from one another who had [illegible] was likely to die in the night

In ship as much as possible the state of general [illegible] and to convince the natives and men that the disease [illegible] Dr McKinnal directed me to collect some black vomit [illegible] who was attacked by that symptom Accordingly I [illegible] of it from a man named Riley I think about two [illegible] Shortly after this he died in consequence [illegible] when I told him what I had done He then [illegible] and about half past twelve the men being [illegible] a wine glass Mr Green the officer of the watch was [illegible] when he called him over and filling a glass full of the black [illegible] him if he would have some of it Being urged to the [illegible] said "Very well I have your health Green and Frank it" [illegible] no other persons actually present but there were others [illegible] time and it became the theme of conversation all over the [illegible] the afternoon Dr McKinnal immediately afterwards [illegible] deck and walked till two o'clock that event being said that [illegible] to any means of counteracting its effects

"It is almost needless say while the story could [illegible] not suffer from any ill consequence afterwards [illegible] for dinner —February 1840 At Lagos 180 miles from land

[illegible] in diagnosis [illegible] the Coast fever [illegible] five cases [illegible]

I [illegible] S N O s journals before referred to two occasions [illegible] all officers and men s leave was stopped at sunset [illegible] in 1859 and 1862—a precaution taken, I suppose [illegible] the evening miasma

The [illegible] decks of H M S *Albert* and *Wilberforce* is not unlike the [illegible] have been made lately to cover in the mess decks of [illegible] gauze screens except that in the latter on this station you [illegible] pumped in, because you cannot keep your dynamo running [illegible]

But the [illegible] to me was to find that quinine was in general [illegible] prophylactic Quinine itself was not introduced into [illegible] until 1820 but I find mention of the cinchona bark having been used as a prophylactic in the Navy nearly 200 years ago

In the Report of the Yellow Fever Commission which differentiates as far as possible the various types of disease known as Coast or Bilious fever one finds several interesting quotations from naval officers journals showing the ups and downs of its prophylactic administration

It was Lind who first suggested its general use James Lind was I learn from S H Rolleston s memoir in the JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE a sea going naval doctor only from 1739 1748 so that in nine short years he gained all the first hand experience which produced his two epoch making treatises, the one on the prevention of scurvy and the other on the prevention of "Coast fevers"

In this latter which he issued while Physician to Haslar Hospital—then a civilian appointment which he held for many years after his retirement from the Navy—he says "Since the last edition of this essay, the ships of war on the Guinea Station are ordered to be supplied at the expense of the Government with a large quantity of bark in powder and of wine to be issued to those who are sent away in boats up rivers and on shore and instructions have been given to Commanders of these vessels not to permit any of these men to remain on shore after sunset

And this was about 150 years before the discovery of the mosquito as the carrying agent of the disease!

It was Lind too who condemned the indiscriminate venesection which was performed as a prophylactic measure on all new comers from Europe

The theory of this procedure was as follows It was observed that Europeans who survived a year or two on the Coast suffered far less from fever than the fresh arrivals, who almost all succumbed to what was called a "seasoning fever" It was argued that the blood of Europeans who became relatively immune was altered by the tropical food which they consumed so, as soon as a newcomer put in an appearance they fell upon

[illegible] in the [illegible]

[illegible] this was unfortunate [illegible] barbarous [illegible] most as much [illegible] the [illegible] priest [illegible] patient was [illegible] suffering from [illegible] either [illegible] that the [illegible] in [illegible] [illegible] writing a [illegible] treatment —

> [illegible]
> [illegible]
> [illegible]
> [illegible]

over his quivering patient

The journals of Mungo Parks travels are disappointing from the medical point of view although he himself was a doctor He [illegible] explorer who set out in 1795 to discover the reputed fabulous wealth of Timbuctoo and trace the course of the Niger returned alone from his first expedition and in his second attempt in 1805 lost thirty seven out of his forty-one companions (he was afterwards killed himself) nearly all from fever, but one finds in both his journals only one mention of medical treatment in which he says he "boiled a camp-kettle of stone, decorated of bark every day

After Lind's fifty prophylactic quinine seems to have fallen into disfavour for a time but later its use became fairly general in the Bights Division especially as regards boats on detached service

In A Report on the Climate and Principal Diseases of the African Station Surgeon Alexander Bryson (1844) says The *Nith* Ship arrived on the Station from England in July 1826 and whilst at Sierra Leone in August the effects of the climate became manifest in the occurrence of a few cases of fever On the 7th of the latter month twenty of the crew were employed in boats or on shore embarking provisions They had wine and bark as directed by the Public Instructions with the exception of Lieutenant Boultbee, who conducted this service He declined taking the prophylactic dose prescribed to the men, and it is not a little singular that he is the only one of the party who suffered from fever

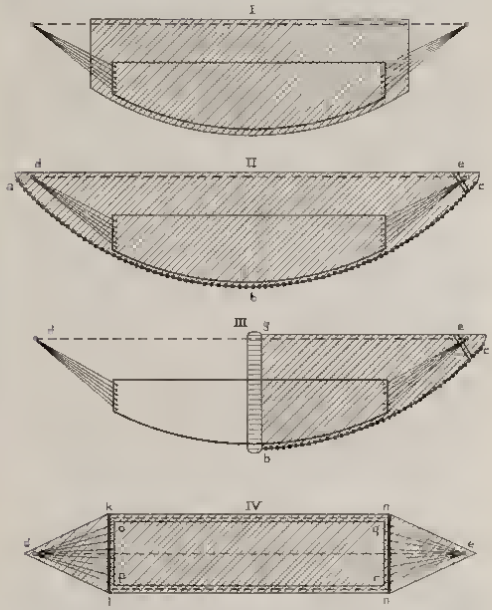
Concerning the *Hydra* in 1844, he says later in his report at the same time the pinnace and the cutter were detached to the Turtle Islands where they remained a fortnight nevertheless not a single man suffered in consequence Bark and wine in prescribed portions were sent with them and duly administered during the whole time This is another instance where bark seems decidedly to have acted as a preventive of the fever

Assistant Surgeon Lames also gives some interesting information in his journals and he always looks at both sides of the question

[illegible] which I quote [illegible]

[illegible]

In a s[illegible] there ne[illegible] lators to be covered in, and so [illegible] projecti[illegible] that even if one constructed tr[illegible] would [illegible] hot and become inefficient



In Lagos Hospital which is I believe the only hospital on the Coast which is screened a man has to go round and examine every screen every day for breakages and misfits and the expense of upkeep is very great

a

[illegible] Prophylaxis against 'Coast Fever' on the W. Africa Station

H.M.S. *Thistle* has tried the experiment of screening only the lower deck but even without the screens the atmosphere below is so oppressive that all hands sleep on deck and up to the time of our leaving the Coast she has not used them.

I append the diagrams drawn by Leading Sick Berth Attendant Leach, of the net which we used.

The ordinary issue of 6 ft. per man was insufficient to cover the hammock clews and slit so we applied for and obtained permission to issue 9 ft.

Fig. 1 shows the extent to which a length of 6 ft. covers a hammock, and figs. 2, 3, 4 the 9 ft. length as we applied it.

The long edges of the netting issued (*a b c* in Diagram II) are sewn together, making the net into the form of a tube which is passed round the hammock before it is slung, and suspended over the hammock lashing (*d—e*) which is passed from hook to hook.

One open end of the tube is then closed by lashing it around the clew (*e—e*). The other open end is rolled back (Diagram III *g—h*) so that the man can get in. Once in his hammock he rolls the net over his head and closes it at the clews by means of a tape (*d*) which is threaded around it and, when drawn taut, turned up on one of the spreaders inside.

Diagram IV. shows the system of spreaders used to keep the net well away from the hammock and the exposed limbs of the occupant.

Two spreaders (*k—l, m—n*), are on the hammock lashing (*d—e*) and two on the clews of the hammock.

It is rather an elaborate process to get in and out, but it does afford complete protection and the men soon got used to it.

No net, of course, is any use unless it is used properly, and I think it is largely due to the keenness of the executive officers of this ship in doing surprise rounds at night two or three times a week until the use of the net became second nature to the men that we have reduced the malaria incidence during the past commission from eighty-nine and forty-five cases during two recent commissions to four cases only.

DENTAL EFFICIENCY IN THE NAVY, BASED ON DENTAL EXAMINATIONS OF FIVE HUNDRED AND SEVENTY-FIVE UNSELECTED OFFICERS AND MEN

By Surgeon [illegible] H. C. GIVEN, M.D., [illegible]

With Remarks by Surgeon [illegible] D.D.S., [illegible]

By way of prefa[illegible] [illegible] to the [illegible] Naval Dental Service if I appeal by the title of my article to those [illegible] I hope to make it clear in my subsequent remarks that the [illegible] which is of equal [illegible] inches.

"Neither medicine nor dentistry can hope to [illegible] what we term preventive [illegible] (*Dental Cosmos.*)

INTRODUCTORY

We were told during the war that the British had the worst teeth of any nation. If correct the statement might be taken as a compliment to our advanced civilization. The higher the civilization the higher the percentage of caries.[1] From this we infer that if the British nation has the worst teeth it must also be the most highly civilized. It is now only among the uncivilized that dental efficiency survives. Are we any the worse?

In the examination of 575 officers and men the following questions were always put. Is your digestion good? Has it always been good? Are your bowels always regular?

The surprising result was that intestinal complaints past or present although comparatively rare, were almost as common among the men who had sound teeth as among those whose teeth were deficient and defective and, moreover, men without a sound opposing tooth had frequently enjoyed robust health from infancy. Occasionally there was a history of some childish ill such as measles. At the same time the diseases of the digestive system bulk largely in our sick returns. It would be interesting to differentiate between those due to or associated with dental disease and those showing no such relationship. As I intend on this point some of the statements in that recent publication dealing with the causes and prevention of dental disease "The Gateway to Health"[2] are of interest.

They are to the effect that doctors who have practised surgery among uncivilized races in various parts of the world have never come across the condition so common in this country known as acute abdomen.

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[1] H. P. Pickerill "Prevention of Dental Caries and Oral Sepsis." Baillière, Tindall and Cox (London) 1912.

[2] Published by the Food Education Society. Edited by Chas. Hecht.

[illegible] duodenal [illegible] practically unknown. It is a [illegible] that [illegible] I have often seen the question [illegible] that aliens from various parts of Europe who come [illegible] sound teeth very soon suffer from extensive dental [illegible]. [illegible] I examined was a Maltese cook with very bad [illegible] three years service. I said to him "Your teeth [illegible] ruining," but he assured me that on the contrary he had [illegible] in his head three years ago.

I [illegible] who had an extensive surgical practice in China, well [illegible] many years he had never had occasion to open the [illegible] and that was for a ruptured malarial spleen which had been caused by a kick in the stomach. I personally attended Chinese [illegible] months and I never saw a case of cancer. Infections [illegible] tuberculosis, malaria, &c., and parasitic diseases of all [illegible] very plentiful.

Dental [illegible] among the Chinese, particularly outside the Treaty Ports, [illegible] much higher plane than it is among the white races.

In [illegible] cancer is rapidly coming to the fore as the first cause of death. It [illegible] already reached second place as a death factor in rural districts, [illegible] only to heart disease, a term which includes many deaths in which the [illegible] is probably doubtful and certainly unconfirmed by autopsy. In New Zealand, one of the healthiest if not the healthiest country in the world, the mortality from cancer has increased by 20 per cent. in ten years.[1] This increase can hardly be accounted for by greater accuracy of diagnosis. In New Zealand the problem of dental disease is almost as urgent as it is in this country.

It should not be a difficult matter to discover whether any true relationship exists between dental disease and cancer of the digestive tract. It is just an interesting supposition for the present to suggest that the two may have a common origin, and further, that that origin lies in our civilized dietary. The problem of dietetics for the healthy is one that has been very much neglected in our medical curriculum.

As a result our dietary is left very much in the hands of the cook. Even the domestic animals who share with us some of our cooked dishes become subject to dental disease. This is particularly noticeable among pampered domestic pets, *e.g.* lap dogs. It is a condition practically unknown among animals in the wild state.

Has Nature ever been known to make a mistake? Why has she endowed us with teeth if not to use them?

An incident which I witnessed several years ago left a lasting impression on my mind. I was shown into the nursery of a child aged 18 months. The room was surrounded by wainscoting about 2 ft. high, with a slightly

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[1] Year Book for New Zealand, 1919.

[illegible] ledge of [illegible] had been all gnawed away [illegible] The [illegible] was the work of the child [illegible] nothing hard for the teeth [illegible] to [illegible]? Nevertheless the cry was heard, [illegible] slops like every other child [illegible] and [illegible] [illegible] twelve months The only hard thing [illegible] was an occasional lump of [illegible]

Again when one finds that an [illegible] can eat and digest its food is [illegible] only infer that the teeth are [illegible] If Nature is right the diet must be wrong [illegible] intended them to be used, and the result is that [illegible] dense

It is with the object of arousing inquiry and [illegible] study that I beg to put forward the following figures [illegible] fully convinced that in the solution of dental [illegible] of many of the more serious maladies with which [illegible] familiar

Dental Efficiency

Classification —I was at a loss at first to find [illegible] classifying dental efficiency The method adopted [illegible] answers the purpose subsequently well in the absence of [illegible] careful care has been exercised in the classification to judge [illegible] fully in its merits, in order that as far as possible the [illegible] and suitable for comparative purposes

The basis of the method is (*a*) molar efficiency [illegible] and (*b*) general efficiency on the other

The latter has been worked in [illegible] shall see it in the table of results

Molar Efficiency —Under this heading we have [illegible] follows —

Group I Represents very efficient opposing molars [illegible] gaps

Group II Good opposing molars [illegible]

Group III Opposing molars [illegible] sometimes only represented by wisdoms

Group IV Opposing molars on one side only

Group V No opposing molars

The cross classification based on general [illegible] was

(*A*) Represents sound teeth (those requiring [illegible])

(*B*) Minor defects requiring treatment

(*C*) Gross deficiencies and defects (either [illegible])

To facilitate comparison all the original figures have been worked out in terms per cent, illustrated in tables and further illustrated in chart form (four charts)

[illegible]

[illegible]		I	II	III	IV	V	[illegible]
[illegible]	A	2 [illegible]8	[illegible]	[illegible]	[illegible]44	[illegible]	[illegible]
	B	5 92	13 [illegible]	[illegible]	5 22	1 11	[illegible]
	C	1 52	11 [illegible]	[illegible]	9 38	[illegible]	[illegible]
		13 22	[illegible]	[illegible]	17 01	[illegible]	[illegible]
[illegible]	A	7 44	10 11	[illegible] 13	[illegible]00	0 [illegible]	[illegible]
	B	6 92	14 [illegible]	[illegible]	1 00	[illegible] 13	[illegible]
	C	9 04	[illegible]	[illegible]	[illegible]	—	[illegible]
		23 40	[illegible]	[illegible]	7 [illegible]	[illegible]	100 00
[illegible] years	A	0 01	[illegible]	1 3	[illegible]	[illegible]	[illegible]
	B	5 56	[illegible]	[illegible]	3 41	[illegible]	17 03
	C	4 32	[illegible]	[illegible]	9 02	6 [illegible]	17 5[illegible]
		10 4[illegible]	38 [illegible]	[illegible]	17 90	[illegible]	100 00
[illegible] years	A	1 19	2 [illegible]	1 19	2 38	—	7 14
	B	3 57	13 10	[illegible]	3 57	3 [illegible]	41 67
	C	1 19	3 [illegible]	0 [illegible]	11 10	13 10	51 19
		5 95	[illegible]	[illegible]	[illegible]	[illegible]	100 00
[illegible]	A	—	1	[illegible]	[illegible]	—	11
	B	5	5	[illegible]	16	1	3[illegible]
	C	1	1	15	[illegible]	[illegible]	63
		6	[illegible]	21	37	[illegible]	100
[illegible]	A		2 [illegible]	[illegible]	[illegible]	—	14 28
	B	[illegible]	1 [illegible]	7 14	1 [illegible]	[illegible]	28 56
	C		—	11 [illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100 00

[illegible] of the [illegible] in the last two groups were [illegible] the following [illegible]

[illegible]	I to [illegible]	III	IV and V
[illegible]	[illegible]	[illegible]	29 04
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible] the last two age groups

[illegible] that all the details of the table could not [illegible] the difficulty has been partly [illegible] (a) molar efficiency and (b) general efficiency separately [illegible] that [illegible] (a) and (b) should be considered [illegible] and

[illegible] sound [illegible] (B) and deficient and [illegible] in all the five groups [illegible]

[illegible] that the [illegible] was made only with a view to recording obv[illegible] this could be done with the aid of the dental mirror, w[illegible] the probe The results therefore will give an underestimate [illegible] the actual conditions existing

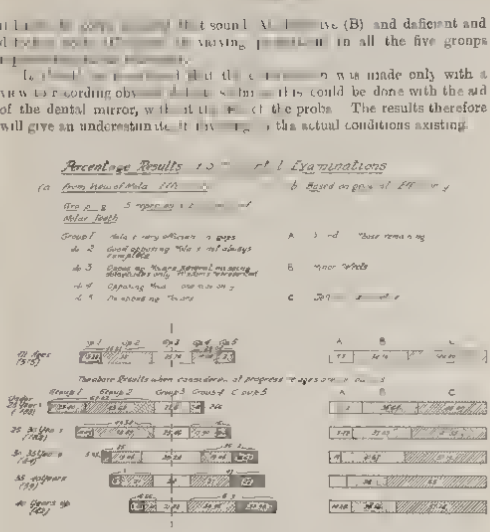


CHART I

The men examined represent ratings belonging to H M S *Woolwich* (Destroyer Depot Ship) and attached tenders who came up for medical examination for M 13 They were in no way selected Time prevented me from getting through the whole establishment especially the officer complement

Subdivision according to Age—When results had been tabulated *en masse* it was found that good teeth were largely the monopoly of the youngest men, so that for purposes of comparison it was considered advisable to classify the results according to age This serves to show the progressive dental deterioration that occurs almost from year to year

It shows also that dental efficiency varies considerably among different ratings of the same age For instance, seamen show a higher standard of

dental efficiency than engine room ratings and the latter a much higher standard than miscellaneous ratings, including cooks, stewards, shipwrights, marines, sick berth staff, &c., not only at all ages under 40, but at several ages.

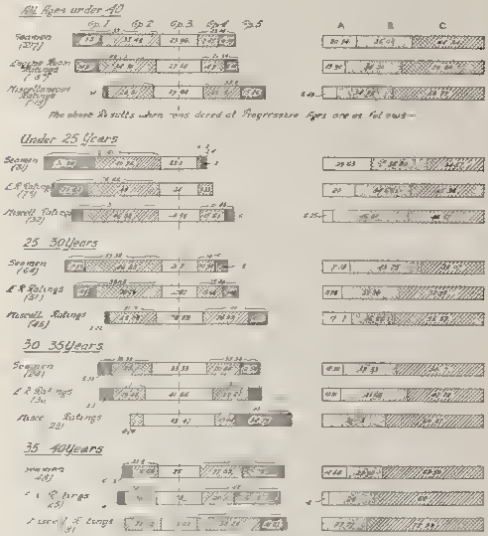


CHART II

ARTIFICIAL TEETH

Artificial teeth are becoming more and more prevalent in the Service. The number being supplied at Admiralty expense appears to be on the increase.

[illegible] amount [illegible] teeth is [illegible] The liability to [illegible] considerable and in many cases the [illegible]

For other reas[illegible] able for [illegible] pocket He has no facilities for leav[illegible] and even under the most favourable conditions [illegible] difficulty [illegible] keep a denture thoroughly clean

The wearing [illegible] against true oral asepsis and is a source [illegible]

It is further consi[illegible] a man keen on outdoor sport &c [illegible] knocked out is always a serious handicap [illegible] to physical fitness and Service efficiency

It would appear desir[illegible] the wearing of small dentures observing that [illegible] are frequently rendered unhealthy by the [illegible]

It must be our object [illegible] maintaining dental efficiency without [illegible]

At the present time [illegible] insists rather than wait for an opportunity [illegible] which [illegible] only available in shortest [illegible] many teeth are lost which might have been saved if [illegible] had been provided

I was struck forcibly by the story of a man with [illegible] excellent teeth who had been advised seven years ago to have all [illegible] out He was told that he had pyorrhœa He did not follow the [illegible] given nor did his gums show evidence of pyorrhœa at the time of [illegible] Further in going through the [illegible] of Group V men I found that between 30 and 40 per cent of them had excellent teeth [illegible] with healthy gums Owing to the serious lack of opposing teeth there could be included in Group V (C) along with others whose teeth were [illegible] and grossly defective

Many of these men had undergone extensive extractions supposedly for the cure of pyorrhœa Is not the cure as bad as the [illegible]

Officers' Teeth—In regard to officers teeth the total number of officers examined was insufficient to which to base any definite statement and of these most were in the age groups over 30 years However from the few examined one was left with the impression (1) that [illegible] money spended by the art of dentistry was very rare among [illegible] compared with the men (2) that even the age of 40 despite the skill of the dentist, dental efficiency in officers was not much better than in the men and (3) probably that at the age of 60 it would be very much worse With these impressions one was led to infer (4) that officers teeth [illegible] healthier

[illegible] of dental [illegible] Until we [illegible] in a position [illegible] which the cause or causes of dental disease, dental efficiency will [illegible] to fall in spite of treatment

Causes and Effects of Dental Disease

The object of my investigation has been not alone to get a rough [illegible] of dental efficiency in the Service but also to [illegible] learn [illegible] about the causes of dental disease in relation to the general health and to discover if possible anything in the early history of the men that would account for premature dental decay Some of the figures expressed in percentages are represented in chart form

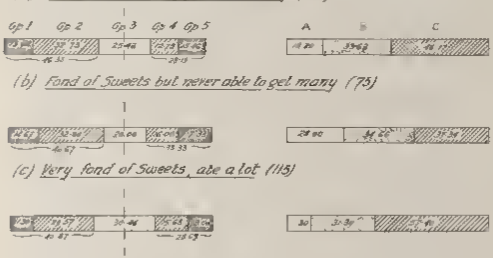


Chart III

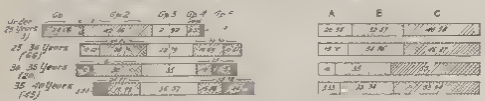
Sweet Eating—The opinion that sweets had a deleterious effect on the teeth was first recorded by Aristotle The same belief still holds a prominent place not only among doctors and dentists, but with the general public to day

The prevalence of dental caries has noticeably increased during the last fifty years or so and has been attributed largely to the ever increasing consumption of sugar and its adulterant commercial glucose.[1]

In contrasting the dental condition of sweet eaters with non-sweet

[1] [illegible] Teeth by [illegible] L D S the *Dental Record* December 1921

[illegible] the [illegible] for men I do not show [illegible] Still [illegible] a difference of 7 per cent in those [illegible] in the numbers showing gross [illegible] (C) the advantage of the non sweet eaters [illegible] advantage is regards molar efficiency Perhaps the [illegible] result of this inquiry is the fact that good teeth and sweet [illegible] compatible in other words, sweet eating is only an [illegible] cause of caries



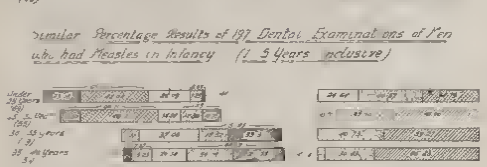


CHART IV

Infectious Diseases in Infancy—It is a recognized fact that the incidence of infectious disease in *infancy* is a frequent cause of hypoplasia of the enamel another predisposing factor in the causation of caries I am particularly interested in this subject as I myself still carry the evidence of measles contracted at the age of four Im other respects I was the healthiest and strongest member of the family in spite of my bad teeth Again for same reasons as in sweet eating the incidence of infectious disease is not incompatible with good teeth Measles appears to be more potent than other infections in causing hypoplasia its occurrence is also much more frequent, but one man who gave a very definite history of bronchitis and pneumonia only at the age of four years showed typical pitting so characteristic of measles Chart IV though based only on the statements taken from the men lends support to my own conviction I used on personal experience that measles which is one of the commonest infective diseases

[illegible] important contributory factor in causing [illegible] and that measures to prevent the early [illegible] be a step towards higher dental efficiency alte[illegible]

It [illegible] shall The protection of school children [illegible] younger children at home

[illegible] was most commonly attributable [illegible] (*b*) accidents (*c*) boxing (*d*) sweet [illegible] prime for malaria (*g*) illness *e g* [illegible] (*h*) heredity &c

[illegible] men whose teeth, though [illegible] of these carries showed no ill effect

[illegible] might [illegible] the case of a chief stoker aged 41 [illegible] except (*b*) two [illegible] roots causing no irritation [illegible] and evenly [illegible] The man had served many [illegible] He had never [illegible] dentist and had never [illegible] this case heredity would seem to have had some [illegible] parents [illegible] had excellent teeth, and [illegible] dentist The mother [illegible] all her teeth under [illegible] worn down and [illegible]

[illegible] of the formidable influence of heredity [illegible] teeth in the parents were followed [illegible] On the other hand the history of bad [illegible] with bad teeth in the family

[illegible] that [illegible] illness involving a diet [illegible] A septic condition of the [illegible] is an occasional complication [illegible] careful nursing, the same [illegible] the incidence of caries

[illegible] against malaria being a cause of [illegible] readily obtainable

[illegible] probably the most [illegible] The use of the toothbrush is now fairly [illegible] instructed in its use a point on which [illegible] The type of tooth brush [illegible] all that many of the men [illegible] on meritable practice

[illegible] was rather impressed by [illegible] (*e*) to) Intractable [illegible] ill effect—the condition was [illegible] time exposed at [illegible] more exposed of the front [illegible] at the neck (*d*) puffed

[illegible] prevalence of [illegible] marked by [illegible] teeth or in [illegible]

Are [illegible] complaint? They were [illegible] conditions peculiar to the users of [illegible] brushes, but in many instances they appeared to be attributable to over- or improper use of the toothbrush.

The different opinions expressed in "The Gateway to Health" on this subject give one food for thought.

A school dental officer from New Zealand raises the query "Are not the best users of the best toothbrushes our best paying patients?" The answer to this query would seem to be found in the paragraph preceding on officers' teeth. The opinion that the days of the toothbrush are numbered is gaining increased support; the need for its further use will only be taken as an index of defects in the dietary. If we may take a lesson from the lower animals, thorough mastication of a wholesome *natural* diet is sufficient for the maintenance of clean sound teeth.

We still retain in our civilized dietary many foods which have cleansing effect on the teeth, such as raw apples and other fruit. In addition they stimulate a healthy flow of saliva which is considered to have a deterrent effect upon caries. Other articles of food, such as carrots and turnips, would probably be much more wholesome raw than boiled and mashed as is the custom to-day.

The importance of mastication for the maintenance of clean teeth is further borne out by the fact that unopposed teeth are invariably discoloured and coated with tartar despite all efforts with the toothbrush. The presence of salivary calculus is one of the predisposing causes of pericodontal disease.

Neglect.—The usual practice with the bluejacket is to postpone his visit to the dentist until he gets toothache. It is then very often found that disease has advanced too far to save the tooth. If he does elect to have treatment, he may suffer such pain in the process that he refuses similar treatment in the future and prefers to have the offending tooth out. If not infrequently happens that when such teeth are filled not necessarily by the Service, extraction is required later for pericodontal disease.

It is common to find that extensive destruction of the teeth can take place without any pain whatever. The most obvious remedy for this state of affairs is education and regular dental inspection followed by suitable treatment. It is not suggested that this line of action means the cure of caries by no means, but it would mean the maintenance of a much higher standard of dental efficiency, considerably reduce the need for dentures, automatically reduce the prevalence of digestive disease, and thereby add to the fighting efficiency of the Service generally.

Boxing.—Many men without opposing units teeth attributed their loss to boxing. The result of getting one or two teeth broken was

gradual destruction of the [illegible] under from neglect [illegible] is obviously a cause that must not be overlooked although one [illegible] expects to find such losses in the front teeth

Of all the causes [illegible] I have I think that none can be regarded as other than predisposing for the real causes we must look back to prehistoric man or to the time when man was on the same plane as the lower animals Here history fails us although we know that among the ancient Britons caries occurred only to the extent of 1 5 to 2 5 per cent

As a contrast I read that in recent examinations of 1 400 odd school children in Northamptonshire only 2 9 per cent showed teeth wholly free from disease Although the latter observation apparently applies mainly to deciduous teeth its relationship with the former statement should not be overlooked

Apart from history we can contrast our present condition with that of the wild animals around us In what respect has civilized man most departed from the natural existence of the wild animal? The answer in so far as it concerns the teeth is most certainly the diet and our mode of mastication

Pickerill gives abundant evidence that this answer is not so simple and as complicated as it looks at first sight because many of the uncivilized races that show immunity to dental disease indulge in cooking their food to an even greater extent than we do Perhaps the greater prevalence of other infections associated with civilization and particularly the air-borne group *e g* catarrh pneumonia infections diseases tuberculosis &c has had an ever increasing influence We know how these infections are often associated with adenoids which in turn lead to malformations of the face and jaws to mention only one example

The fact that in Norway good teeth were revealed in 17 per cent of country dwellers as compared with 4 6 per cent in town dwellers would appear to lend support to this supposition

Perhaps also the cumulative effects of evil influences during the centuries of civilization have gradually resulted in poorer enamel formation Pickerill[1] shows that the enamel is thicker and less porous in the Maori than in the Caucasian Pickerill[1] emphasizes some points of difference in the habits of these immune races which he thinks important, namely they have only two meals a day in the morning and evening respectively they are hungry at mealtime they are happy and they are in no hurry We on the other hand are never really hungry we have too many meals we are invariably in a hurry to get back to work and our minds are never at rest

It is obvious therefore that the dietetic origin of caries is not so

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[1] Report on Aetiology of Dental Caries pp 130 139 (Transactions of Sixth International Congress 1914) N P Pickerill M D M D S L D S

straightforward when one comes to analy[illegible] by thorough investigation

Effects of Dental Disease—It seems p[illegible] that the reason why dental efficiency is so poor generally is th[illegible] diseases of the teeth often reach an advanced stage without th[illegible] of symptoms, either local or general I have already noted that [illegible] had enjoyed robust health from infancy frequently had very bad [illegible]

Is it possible that no evil consequences [illegible] cases? It seems more than likely that as a result of th[illegible] going on later effects are slowly incubating which in [illegible] themselves in arterial degeneration and premature senility I [illegible] that many of the deaths occurring after middle age diagnosed [illegible] are primarily arteriosclerosis caused by this chronic int[illegible]

Are our standards of physical exam[illegible] only stringent if they do not enable us to detect any abnormality in [illegible] One wonders whether the recent sudden death [illegible] is not a case in point observing that he had been passed [illegible] before as a first-class life Is it necessary to add that [illegible] of all cases of chronic arthritis are due to defective teeth [illegible]

Imperfect Mastication—I have [illegible] the rough mastication is the remedy for the majority of [illegible] Imperfect mastication at all meals is the rule rather than the exception The result is that the important digestive action of the [illegible] on the starches of the diet is largely lost and a greater strain is thrown upon some other part of the digestive tract Consequently digestion is less thorough, a certain amount of food is last undigested and perhaps most important the teeth suffer from disuse It is an example of adaptability of the human organism that more obvious ill effects do not accrue

Again one might ask are the many intestinal infections so prevalent in this country appendicitis ulcers of the stomach and duodenum &c and even cancer, not the later manifestations of the various breaches of Nature's laws that have crept in with our civilization?

Those diseases are not necessarily associated with bad teeth as I have come across many pronounced exceptions—mentally [illegible] men with most excellent teeth who showed old scars of appendicitis and one officer with quite good teeth who had also undergone the operation though he admitted that his teeth required treatment then [illegible] I have also known cancer occur in association with good teeth But are there not enough irregularities in our dietetic system to account not only for all the infections referred to but also for our bad teeth It seems probable that the causes of both are closely associated and that the prevalence of one or other is a question of the weakest link Further investigation in this direction may go to prove over again the significance of the old adage "Prevention is better than cure

Over-eating—Is it not a fact that we all eat about twice as much as

[illegible] necessary for health? Real hunger is self-[illegible] Our [illegible] are at such short intervals that the stomach [illegible] never rests [illegible] which is a complaint peculiar to man and [illegible] pets would [illegible] of the results. If not actually the [illegible] of [illegible] some dietetic error. Bright's disease, as [illegible] diseases which have been showing a steady increase [illegible] for some decades.

[illegible] is the result of more accurate diagnosis, or is it another [illegible] manifestations of dental disease and dietetic irregularities?

[illegible] seem therefore that the consequence of our departure from Nature in regard to diet in the process of civilization has had very far-reaching effects in regard to health and physical welfare. Here surely are the secrets of dental and intestinal diseases and here also the secrets of longevity. No field of preventive medicine presents greater possibilities. Its exploration deserves the full attention and co-operation of all scientific investigators.

The causes of dental disease have been sought in disordered functions of the endocrine system, particularly the parathyroid. It is suggested that the proper function of these glands is a wholesome *natural* dietary is essential.

CONCLUSIONS

From the foregoing remarks it might be inferred that dental hygiene has little significance for the Navy, because dental disease is already [illegible] on a large proportion of the new entries. Surgical dental [illegible] cannot prevent the recurrence of caries; nevertheless, I [illegible] that if we originate a thorough campaign based on principles [illegible] a study of Nature and biology, we shall sooner or later [illegible] of Nature's secrets.

It should be at least possible to pass men out of the Service as sound dentally as when they joined.

With this objective it is suggested:—

(1) That the Naval Dental Service be increased so that there would be one dental officer to every 700 of the personnel; that every ship with that complement would carry a dental officer, as in the American Navy, and would be equipped with a well appointed dental surgery.

A certain number of the sick berth staff should be trained as dental dressers. In smaller ships dental officers should be available in the same proportion, borne if necessary in the senior officer's ship.

All dental work in the Navy should be done by the Navy.

Every rank and rating should have his teeth thoroughly overhauled on entry and inspected as often as considered necessary subsequently. It is [illegible] that men should be permitted to refuse necessary dental treatment and thereby risk ill health and [illegible] general efficiency.

(2) Closer co-operation between the medical and dental services.

[illegible] difficulties and encou[illegible] particularly as regards our present [illegible] into diets, health and dental efficiency [illegible] there are many opportunities.

(4) Health propaganda illustrated, with the object of [illegible] each individual a personal interest in himself his teeth [illegible] (ii) of teaching him the importance of early treatment [illegible] and the serious consequences of extractions when [illegible] (iii) the proper use of the tooth-brush and its limitations [illegible] importance of thorough mastication for good health [illegible] (v) the principles of a healthy dietary and the foods that [illegible] the end of a meal for their cleansing action on the teeth [illegible] tions and information concerning animal life diets habits [illegible]

On these lines it should be possible to completely control dental disease and its concomitant ills and advance the cause of preventive [illegible]

During the war the cry at one time was munitions munitions more munitions at another ships, ships more ships, &c. [illegible] now the cry is dentists dentists, more dentists

There seems to be a shortage everywhere to meet the ever growing demand It is the duty of dentists and doctors alike though perhaps suicidal for themselves to end all this by discovering how to prevent dental disease

When we have done that, we shall then be allowed to retire into private life with a good pension perhaps

Remarks on the Foregoing by Surgeon Commander (D) E. L. Fletcher, O.B.E. R.N.

The problem of dental efficiency in the Navy is undoubtedly one of very considerable importance and Surgeon Commander Given's careful investigations cannot fail to be of deep interest to all concerned in this matter It has long been known that the dental condition of the personnel is far from satisfactory but no attempt has hitherto been made to demonstrate this fact so clearly or to indicate the extent to which dental inefficiency prevails

The important bearing which dental efficiency has upon general physical well being and actual Service efficiency cannot be overestimated nor should it be overlooked that the special conditions of service in the Navy require that the very highest state of efficiency should be maintained and disease of every description reduced to a minimum by every means known to science or discoverable by research The author has indicated that dental caries was rare among ancient races living under primitive conditions and that in modern uncivilized races the freedom from intestinal [illegible] appears to bear a direct relationship to their comparative immunity to dental disease, an argument strongly in favour of the need for some [illegible]

[illegible]ution in the dietary of modern civilized races It would appear that the Naval Service should offer very favourable opportunities not only for [illegible]se investigation of this problem but for such necessary reforms to be [illegible]cted as the results of inquiries indicate, for example, improvement in the methods of preparation of foodstuffs whereby their tendency to lodge [illegible] in between the teeth, and undergo acid fermentation in the mouth [illegible] be reduced

The statement that dental caries is a disease unknown among animals [illegible] the wild state does not appear to be strictly in accordance with the [illegible]ments of some reliable authorities Although it is an extremely rare [illegible]ition it is not entirely unknown and cases have been recorded

The classification adopted by the author is a good one and serves the purpose admirably It displays with great clearness the truly alarming condition of dental inefficiency among the naval personnel and indicates the vast volume of work to be performed in order to stamp out the ravages of past neglect and obtain if not perfect dental efficiency at least a state of reasonable efficiency

Although the number of cases examined is comparatively few and includes a preponderance of men over the age of 25 years *i e*, men who were entered prior to or during the late war the conditions shown may reasonably be considered as representative of the dental condition of the present personnel, though had it been possible to include a larger number of men entered since 1920, it is probable that their average condition would assume a more favourable aspect The condition disclosed will not come as a revelation to those officers who have been intimately concerned for any length of time in the question of dental efficiency in the Navy in fact many have experienced serious misgivings as to whether a state of even reasonable dental efficiency ever can be obtained

It is interesting to find that the general expectation with regard to the comparative efficiency of the different branches, as shown in the tabular statements is justified This may be due in some measure to the fact that better facilities for early dental treatment have existed at the boys training establishments than elsewhere and efforts made to train boys in the intelligent use of the toothbrush Facilities existed, though to a more limited extent for the treatment of other ratings on entry but it was generally found that the miscellaneous ratings were not readily obtained for treatment or disposed to avail themselves of the opportunities offered

What are the main reasons for the existence of such a vast accumulation of arrears of preventable dental disease? We have had dental officers attached to the Service for some years they have been stationed at the home depots, hospitals and training establishments and have been well supplied with useful equipment and stores &c The true reason for it has been indicated by the author in his concluding remarks—insufficiency of dental officers to contend with even a small percentage of the work required A [illegible] reason may be lack of encouragement

For successful work to be accomplished it is necessary that the individual should have reasonable prospects of seeing good results from his efforts that he shall not have cause to regret the career he has chosen and that he shall have ample opportunity to give his best work under the best possible conditions

It has been extremely discouraging in the past to find that after spending considerable time and trouble to render new entrics dentally fit these same men owing to lack of facilities to obtain the necessary ' following up treatment return from a commission in as bad or almost as bad a condition as before treatment was undertaken It is equally disheartening to find that teeth which could have been saved with the greatest of ease if they had been attended to in time have, in consequence of delay, arrived at such a condition that hours of work are required to save them or that extraction has to be resorted to owing to the number of equally imperative cases awaiting treatment

With regard to dental treatment it is absolutely essential that every new entry shall be rendered perfectly dentally fit on joining By this it is meant that every cavity however small shall be discovered and repaired and every tooth possible should be conserved providing it is likely to be functional This alone is insufficient and it is equally necessary that having once been rendered fit, the individual shall be educated to take a personal interest in his teeth and given every facility to obtain treatment when necessary Such means combined with frequent and careful dental examination by a dental surgeon would it is considered repay the cost of such service to the State by reason of the improved physical condition and consequent greater Service efficiency resulting therefrom, apart from the elimination of dentures and invaliding for causes attributable to dental neglect

Except that there is some evidence of decline in the number of applications for the supply of dentures at Crown expense received through the main depots Surgeon Commander Given s remarks concerning artificial teeth are fully justified That dentures are necessary in a good number of cases cannot be denied but there is evidence that, in a considerable number of cases, they are not only unnecessary but a source of danger It not infrequently occurs that men are supplied with dentures which cannot have any material effect in restoring masticating area though they may improve their appearance It is not intended that such dentures should be supplied at the expense of the State but until such time as it is possible to overcome the difficulties consequent upon past neglect, and the dental staff is sufficient to treat the personnel more thoroughly only such dentures as may be imperatively necessary to maintain efficiency should be supplied at public expense except those required as the result of an accident directly attributable to the Service

When all the conditions of naval life are considered it would appear that the Service efficiency of a man who is dependent either partially o

wholly upon artificial teeth is very materially impaired and he can be placed in almost the same category as a man dependent upon an artificial limb

From general experience it is considered that if a larger number of officers are examined it will be found that their general state of dental efficiency is higher than that of the men although this condition may have been attained as the result of dental treatment

The predisposing causes of dental caries mentioned by the author are among those recognized by dentists, but with regard to medicines taken during the treatment of an illness it appears doubtful if the medicine or the disease necessitating its use should be considered as the predisposing cause of the dental disease

Of the gum diseases enumerated it is possible that some have their origin in the use of unsuitable tooth powders The possibility of infection from the use of non sterile toothbrushes should not be overlooked as a factor in producing inflammatory conditions of the mucous membrane.

The author suggests measures by which the present condition could be improved and although in accord with those suggestions generally at the present time one would naturally approach the realization of such ideals with great hesitancy, and until better financial conditions are obtained it does not seem that we shall be able to retire with that feeling of self satisfaction and contentment visualized but must continue to do the best we can with the material obtainable If ever the Dental Service can be sufficiently extended to fulfil its function adequately it would appear that it would be more economical to have a combination of permanent and temporary officers in even a more generous ratio to the number of men in time than that now suggested and when the arrears have been sufficiently overcome the number of dental officers could be reduced to one for every 800 1 000 men by allowing the temporary appointments to lapse. Under existing conditions much could be done by accepting for entry into the Navy only recruits of a high dental standard in order that they could commence their Service career dentally fit In the days when the supply of recruits was less than the demand that close attention to the dental condition, so desirable from every point of view fell somewhat in abeyance and teeth were passed as savable which were quite impossible of repair. It should now be possible to let the pendulum swing in the opposite direction and count no tooth savable unless it is quite obvious that it is so

All new entries, and as many of the existing personnel as practicable, should receive careful instruction in the care and use of their teeth Lectures on oral hygiene could be made very interesting to even the most casual by the introduction of suitable lantern slides or films

The desirability of all naval dental work being undertaken by dental officers specially trained for this work and having an intimate knowledge of Service requirements is important The civilian practitioner in the majority of cases, cannot be expected to treat these cases from quite the

[illegible] view e g they [illegible] of [illegible] conservation [illegible] [illegible] [illegible] when the need for a dental [illegible] It should also be borne in mind that the cost of [illegible] to the [illegible] civilian practitioners is expensive to the State when indulged in as extensively as now The urgent need for a good number of dental officers in sea-going ships is fully recognized and it is only by this means that the difficulty can be overcome As soon as circumstances permit, it is intended to appoint dental officers to ships as generously as possible

It is only by the closest of co operation of the Medical and Dental Branches that dental disease and the ills dependent upon it can be reduced They have a common object in view—the elimination of disease—and by reducing dental disease at least some of the minor ailments for which the medical officers are consulted would disappear

In conclusion I desire to express thanks to the author for having permitted me to peruse an advance copy of his interesting and welcome paper and his invitation to append remarks on the results of his investigations

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SOME OBSERVATIONS ON GONORRHŒA IN THE NAVY WITH AN ANALYSIS OF ONE THOUSAND CONSECUTIVE CASES TREATED ON ORTHODOX LINES

By Surgeon Commander P M Rivaz M B R N
and
Surgeon Commander F G Hirch M B R N

The treatment of gonorrhœa remains one of the great problems of the Naval Medical Service and is still unsatisfactory In the present article an attempt has been made to analyse the statistics of one thousand consecutive cases treated in the venereal wards of the Royal Naval Hospital Chatham on what may be termed orthodox lines

It is well known that gonorrhœa is one of the most difficult diseases of which to obtain reliable statistics the reasons for this are evident In our opinion it is impossible to arrive at accurate conclusions from the statistics of cases in civil practice, even if they are not collected as is so often the case in order to prove the merits of some novel method of treatment Even in the Navy where men are kept under constant observation for considerable periods statistics must be liable to certain errors

However this present series of figures have been compiled with no ulterior motive they are not intended to prove the efficiency of routine orthodox treatment but rather to demonstrate its defects and there has been no conscious, nor we believe, subconscious attempt to discharge

[illegible] stringent tests [illegible]

During the last [illegible] years numerous [illegible] have published statistical results of small numbers of cases treated by some special method, but only too frequently the cases have been "selected" ones and also no definite tests of cure have been adopted. To take a recent fairly typical example —

M R Lautier[1] in advocating the treatment of gonorrhœa by cedar wood oil, in a paper read before the Société de Thérapeutique at Paris gives as his tests of cure —

(a) Disappearance of all discharge

(b) Disappearance of all filaments in the first jet of urine passed on getting up in the morning

(c) Disappearance of all subjective symptoms in the patient

Now by none of these tests can the cure of a case of gonorrhœa be confirmed and deductions drawn from such results are evidently valueless as a means of estimating the efficiency of any method of treatment

As a rule English venereologists adopt much more stringent instrumental and bacteriological tests before passing a patient as cured. Typical and accurate examples are those of the Special Committee upon the Standardization of Pathological Methods[2] of the Medical Research Council and those given by Dr Clarkson[3] in a paper read before the British Medical Association at Newcastle

The tests carried out in the cases under consideration are as follows —

Tests of Cure —After the patient has had —

(1) No discharge for five days,

(2) A two glass specimen of urine clear,

(3) Prostatic and vesicular examination negative clinically and bacteriologically

(4) Urethroscopic examination negative

he is put on test for cure This consists of —

(1) The administration of a provocative dose of 250 millions gonococcal vaccine in those cases where vaccine treatment has not already been carried out

(2) Suspension of all treatment and encouragement to play football and perform hard work in the wards and grounds

(3) Prescription of a tonic stimulating mixture and permission to use condiments—this in the unavoidable absence of alcohol

(4) Examination at the end of the sixth day if patient is still clear of all discharge of a suction smear taken by Mills suction apparatus before the morning urine has been passed This is examined for gonococci

(5) Examination of a two glass specimen of morning urine for sediment, filaments mucus and flakes

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[1] *Lancet* December 3 1921

[2] Sp Rep No 19

[3] *Brit Med Journ* September 24 1921

N[illegible] In chronic cases this [illegible] A few scan[illegible] calls from the prostate or anterior u[illegible] d by massage or such [illegible] are ignored provided that bacteri[illegible] examination is consistently negative, and a man may be passed [illegible] although he may have a faint cloud of mucus in his morning u[illegible] Such cases are urged to come up for further examination in a month's time

MARRIAGE TEST —One of the most responsible duties a medical officer has to undertake is that of telling a man whether he may safely get married Men who seek advice in this matter are often of a neurotic type they have had perhaps an occasional morning tear for years they often suffer from phosphaturia and make a habit of examining minutely their own urine and are consequently often disheartened and discouraged by the presence of a purely physiological deposit such as oxalates or urates on a cold morning

These cases are submitted to the following tests —

(1) A thorough clinical examination is made with special reference to the prostate and vesicles not forgetting that cowperitis is a complication occasionally met with A urethroscopic examination is then made to eliminate the presence of gross lesions such as submucous infiltration, lithiasis, and infected pockets of Morgagni Should periurethral follicles be present they are easily detected by palpation over a sound

(2) If no obvious source of infection has been discovered a provocative vaccine of 250 millions is given followed, after two days by a bacteriological examination of any obvious discharge or if no discharge can be obtained of a suction smear A bacteriological examination is also made of the fluid obtained by prostatic and vesicular massage

(3) Any abnormal constituents of the urine are examined microscopically and culturally

(4) If all the above tests are negative the patient is sent to full duty and instructed to take plenty of exercise especially cycling He is told to draw his rum, and if possible to drink a pint of stout each evening He is strongly advised not to look at his penis for the suspected morning tear and not to scrutinize his urine

(5) He is told to report himself in a month's time, when these tests are repeated If still negative, he is told it is safe to marry

We have not used the complement fixation test, as it is of little value in actual practice especially if vaccine treatment has been previously adopted

It will be seen however, that even these tests are not conclusive in view of the relapse cases which occurred in our series It must be remembered that all our relapse cases do not return to us for treatment but in many instances must find their way to other hospitals This is evident from the number of relapses from other hospitals which we have to deal with

Several tests of cure should, of course, always be made at intervals of weeks or months, but under Service conditions this is impracticable

[illegible] shing between [illegible] mitted to hospital [illegible] admit having exposed them [illegible] shortly after discharge from hospital On the [illegible] must not immediately be labelled [illegible] uninfected, on careful examination are frequently [illegible] examples of relapse an old focus of infection having [illegible] alcohol

In [illegible] treatment of gonorrhœa we again wish to emphasize that [illegible] claim [illegible] loping original methods or to having attained [illegible] We should welcome criticism and advise, and venture to hope [illegible] may be the means of stimulating interest in the various problems [illegible] among naval medical officers

A well known military venereologist recently stated that some of his very superior officers used to tell him that the treatment of gonorrhœa had not advanced for the last thirty years We have few "very superior officers" in our Service and everyone realizes that we all try to discharge our cases bacteriologically clear but even now our relapses are too frequent, complications common and the length of time spent in hospital and lost to the service is much too long

Treatment of Acute Cases

All patients are to be put on low diet and given a saline purge A [illegible] if any discharge is immediately taken and we receive the result [illegible] the laboratory next day Scalding pain on micturition is relieved by [illegible] mixture and, if chordee is present potassium bromide gr xv [illegible] prescribed at night Copious draughts of barley water are encouraged For the first few days patients are put on anterior irrigations of potassium permanganate, 1—8 000 Directly the discharge becomes mucopurulent, this patient is allowed up on full diet with the exception that condiments are forbidden He wears a suspender which he makes himself according to Colonel Harrison's pattern He is now put on posterior irrigations of potassium permanganate 1—6 000 which is gradually increased to 1—3 000 as the discharge subsides We carefully supervise the irrigations ourselves for such time as we are satisfied that the patient can do them properly Furthermore each batch of new patients is told in simple language what the objects of irrigation are, and warned against possible complications It is not our habit now to prescribe oleo balsams such as copaiba or cantal oil as we have come to the conclusion that they are of limited value The urine is examined every few days When the discharge has subsided [illegible] tear the patient irrigates with an astringent lotion such as [illegible] sulphocarbolate gr ii ad i and at the end of three weeks he is [illegible] and his prostate and vesicles examined We lay emphasis [illegible] subjecting patients to instrumentation too soon as it only tends to [illegible] the inflamed mucous membrane and open up channels of infection

We now always start our acute cases on irrigations of potassium permanganate We have tried almost every recommended solution, but none of them appear to have any advantage over our well-known friend If a case hangs fire we ring the changes on acriflavine zinc permanganate oxycyanide of mercury and the silver salts but a lotion has yet to be discovered which shows a marked superiority over its fellows

Treatment of Chronic Cases

Cases of chronic gonorrhœa have obviously to be treated on their merits A most careful examination is necessary to try and localize the causative lesion in only too many cases we have failed to do so in spite of the fact that smears show the presence of gonococci We have tried autogenous vaccines in intractable cases with apparent benefit in some individuals and with disappointing results in others

It must be remembered that cases of chronic gonorrhœa often clear up spontaneously without any specific treatment and care must be taken not to vaunt any particular remedy when only a small number of cases are concerned

We certainly seem to have had success with Mulford's serobacterin but owing to the cost of the preparation the number of times it has been used is limited Quite a useful therapeutic measure is Mills's suction apparatus If used judiciously it not only helps to open up and drain affected pockets and glands but it also flushes the inflamed urethra with antibodies Its use occasionally gives rise to considerable hæmorrhage but this is never really alarming and gives the patient no pain

Submucous infiltrations and strictures are dilated with Hollmann's straight dilator provided of course that it is possible to pass the instrument through the obstruction It is necessary to go easy with the dilatation and desist directly the patient complains of the slightest pain especially at the first attempt At subsequent sittings dilatation should be gradually increased by not more than two divisions on the scale at each time

Prostatic and vesicular infections are treated in the orthodox way by massage *per rectum* It is as well to fill the bladder first with oxycyanide of mercury 1—1000 After the massage the patient empties his bladder and a good view of the expressed matter is obtained After massage we always prescribe an atropine suppository 1/60th of a grain

One of the most intractable complications is periurethral follicle In those cases where by urethroscopic examination it is possible to localize the opening into the urethra fusing with silver nitrate usually effects a cure though several applications of the caustic may be necessary

Sometimes, however, the follicles may be palpated over a sound but the openings cannot be seen as the mouth of the follicle is blocked by inflammatory exudation In these cases massage over the obturator of the

urethroscopic tube has to be resorted to, and in several instances it has been necessary to dissect the mass away from outside The resulting wound of the urethra heals in a few weeks, though a traumatic stricture has to be guarded against by periodic dilatations

In gonorrhœal rheumatism which is essentially a complication of a posterior urethritis treatment is first directed towards the urethral condition the prostate and seminal vesicles receiving particular attention as infection of these organs is almost invariably present in such cases

Radiant heat and diathermy are used as a routine practice Gentle massage of the muscles above and below the affected joints is adopted from the beginning to prevent, as far as possible the extreme muscular wasting which is apt to occur

If the affected joints are very acutely distended and painful, much benefit is obtained from aspiration and we adopt this simple procedure in most of our acute cases

Vaccine treatment is always instituted We have not treated any cases by the protein shock methods which have been recently advocated

In connection with some cases of chronic urethritis we should like to enter a strong protest against overtreatment Several cases have come under our notice who have been irrigating and had active treatment by bougies &c almost constantly for years Careful examination has failed to reveal any active lesions and smears have been negative bacteriologically Suspending treatment has resulted in the gleet completely disappearing

Men with chronic urethritis drift into a highly neurotic state In every public urinal they enter they are confronted with notices warning them of the dangers of venereal disease both to themselves and others Every time they urinate they try to squeeze up a drop of discharge and they never give their poor unfortunate penis a rest

Medical officers themselves are to blame to a certain extent Since venereal clinics have been instituted all over the country, the doctors in charge feel they must justify their existence, and we are strongly of the opinion that the present tendency is to overtreat the disease

With regard to vaccine treatment we have not used detoxicated vaccines owing to their prohibitive cost if bought and the labour and time required to make them ourselves Furthermore we are not convinced of their superiority over an ordinary well prepared vaccine

Every suitable case is sent up to the laboratory to have a culture taken and thus the vaccine pot is kept boiling and a mixed strain is always on tap

An initial dose of 50 million gonococci is given and the dose is increased every three days by 50 million until a final dose of 500 million is reached Local and general reactions are very uncommon

Our course of colloidal metals closely follows that recommended by their originator Mr J E R McDonagh, and is as follows —

Two subcutaneous injections of 0 5 c c of 'pallamine (colloidal palla-

[illegible] were given at 48 hours interval, followed [illegible] doses of colloidal manganese given intramuscularly in [illegible] increasing to [illegible]

NOTE ON THE PREPARATION OF GONOCOCCAL VACCINE

The vaccine used has been prepared at the [illegible] the following technique being used

Cultures from the urethral pus of all early [illegible] Petri plates of trypsin-leguminosa agar enriched with [illegible] while human blood obtained by venepuncture and added [illegible] medium immediately before pouring the plates [illegible] medium is adapted to Ph 7 A luxuriant growth [illegible] usually obtained very frequently in pure culture The growths from pure cultures after 18 hours incubation, and of subcultures of the gonococci from mixed cultures, are washed off with saline, after disintegration in the mechanical shaker, are suspended in a 0 6 per cent solution of acid sodium phosphate Estimation of strength of suspension is made by comparison of opacity with a standard counted suspension

Autogenous vaccines either of pure gonococci or of gonococci with secondary infecting organisms such as diphtheroid bacilli are only prepared for chronic intractable cases

We have experienced considerable difficulty in compiling the statistical tables As stated above we have taken a thousand consecutive cases without any selection, and in many instances it has been hard to decide under what heading they should be classified

A very recent case of gonorrhœa is uncommon in hospital Most patients when admitted have had the disease for at least some days, and a considerable number are only sent in when complications have arisen necessitating more detailed treatment than can be given in a ship or ordinary establishment In fact, men never arrive in hospital sufficiently early to warrant abortive treatment

Cases have been recorded as "first infections" and "fresh infections" even if they had been under treatment elsewhere for some time so long as they had no obvious complications when admitted No doubt such individuals often actually arrived in hospital with posterior infection or some other lesion which was not immediately diagnosed

RELAPSE CASES FROM CHATHAM were all originally treated by one of us and had passed the "tests for cure" enumerated above To adhere to our plan of one thousand consecutive cases a few of the relapses were actually treated in the first place before the date when this series commenced

RELAPSE CASES ELSEWHERE were originally treated in other hospitals and establishments, including large civilian clinics all over the country

Cases have been classified as "chronic urethritis" where there was a more or less continuous history of gleet for months or years

TABLE [illegible] —[illegible] IRRIGATION ONLY

	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		Post metatarsal [illegible]		[illegible]		[illegible] of Bartlett		[illegible]		[illegible]		[illegible]
								No	[illegible] cent	No	[illegible]	No	[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	3	3 11			[illegible]	2 1	1	1 0	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 67	1	1 03	1	1 53	3	1 07			1	1 [illegible]	[illegible]
[illegible]	10		1	[illegible]	1			1	9			1	9					[illegible]
[illegible]	[illegible]		1	[illegible]	[illegible]			1	3 57			1	3 57	1	3 5			[illegible]
[illegible]	[illegible]		1	[illegible]	[illegible]	[illegible]	[illegible]			3	6 02	[illegible]	6 [illegible]			1	1	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1[illegible]	3	6	2 1[illegible]	4	1 61	[illegible]	3 67	2	0 [illegible]	4	1 64	10

[illegible]

(1) [illegible]
(2) [illegible]
(3) [illegible]
(4) [illegible] left knee [illegible]
(5) Right [illegible]
(6) Both [illegible] right ankle [illegible]
(7) Left knee
(8) Right knee
(9) Multiple arthritis of knees [illegible] phalanges
(10) Multiple fingers and knees planter fascia
(11) Left elbow left knee, left wrist
(12) Right ankle
(13) Left elbow right knee

[illegible]—

(1) Flat foot (No 3)
(2) Flat foot (No 10)
(3) Arthritis (No 2)
(4) Arthritis (No 6)

TABLE B.—CASES WITH PALLIMINE AND MANGANESE COURSE

—	Number of cases	Urethritis		Prostatic infection		Epididymitis		Arthritis		Peri-urethral follicle		Stricture		Submucous infiltration		Eye symptoms		Invalided		Average number of days sick
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	
First attack	1[illegible]0	11	9 16	7	5 83	11	9 16	3	2 5	2	1 66			1	3 33	1 iritis				48
Fresh infection	68	8	11 76	5	7 35	6	8 82	1	5 88					2	2 94			1	1 46	31
Relapse Chatham	16			1	6 25	3	18 75			1	6 25			3	18 75					11 3
Relapse elsewhere	97			5	18 51	3	11 11	1	3 7					2	7 4					46 2
Chronic urethritis	5[illegible]			9	21 32	4	24 33	5	13 51			3	8 18	3	8 18			2	5 4	55 5
Total	268	19	7 08	27	10	32	11 94	13	4 85	3	1 12	3	1 12	11	5 18	1	0 37	3	1 12	49

Thirty Cases

(1) Both knees effusion
(2) Right knee
(3) Both knees right shoulder
(4) Both ankles plantar fascia
(5) Right wrist
(6) Right [illegible]
(7) Left knee right ankle
(8) Right wrist [illegible]
(9) Both metacarpo phalangeal joints
(10) Right knee
(11) Right knee right hip and ankle
(12) Metacarpo phalangeal joints
(13) Both shoulders

Invalided—

(1) Chronic urethritis fifth attack
(2) Arthritis and flat foot (No 1)
(3) Arthritis (No 9)

TABLE [illegible] UNDER VACCINE TREATMENT

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Arthritis		Peri-urethral follicle		Stricture		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
										No.	Per cent.	No.	Per cent.	No.	Per cent.										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	1 74	1	2 38			[illegible]	[illegible]	[illegible]	1 11	[illegible]	[illegible]	[illegible]	1 11	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2	1 31	7	1 7			[illegible]	[illegible]					[illegible]	1 [illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	8	2	8			[illegible]	20					[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	9 43			[illegible]	[illegible]		[illegible]			1	1 8	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	18	[illegible]	[illegible]	[illegible]	5	5 23	4	4 73	4	4 73	12	[illegible]	1	1 [illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1600	52	7 10	18	3 69	22	4 51	4	0 82	29	[illegible]	3	0 61	10	2 05			19			

Invalided—

(1) [illegible] right ankle
[illegible]
[illegible] metacarpo phalangeal joints
[illegible] right elbow, left shoulder
[illegible]
(9) Left knee, right ankle
(10) Both knees, right ankle, right shoulder (keratodermia blenorrhagica)
(11) Right knee, left ankle
(12) Right shoulder, left hip, both knees and ankles
(13) Metacarpo phalangeal joints
(14) Right knee effusion
(15) Left hip
(16) Left knee, left ankle.
(17) Left knee
(18) Left shoulder and elbow

Invalided—

(1) Chronic urethritis, third attack, refused treatment
(2) Chronic urethritis, three years duration
(3) Chronic urethritis, Refused treatment
(4) Arthritis (No 1)
(5) Arthritis (No 5)
(6) Arthritis (No 10)
(7) Arthritis (No 12)
(8) Chronic urethritis, two years duration
(9) Chronic urethritis, refused treatment
(10) Chronic urethritis, third attack

Eye Symptoms

(1) Conjunctivitis
(2) Iritis
(3) Conjunctivitis

TABLE D.—SUMMARY OF 461 CASES

	Number of cases	Previous attacks		Posterior infection		Epididymitis		Arthritis		Purulent follicles		Stricture		Submucous infiltration		Eye symptoms		Incurable		Average number of days sick
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	
First attack	340	60	10 5	29	7 11	29	7 11	10	2 5	9	2 3			11	2 59	4	1 0	5	1 28	40 1
Relapse after cure	282	40	14 1	21	9 22	19	6 73	8	2 8	8	2 8	1	0 35	9	3 10			3	1 06	47 4
Relapse after stricture	52			9	19 22	5	9 61	2	3 84	4	7 69			9	19 22			1	1 92	42
Relapse elsewhere	108			30	27 77	13	11 11	5	4 62	6	5 55			5	4 62	1	0 925	1	0 925	1[illegible]
Chronic urethritis	168			31	18 45	35	20 83	19	11 30	4	2 22	10	5 95	18	11 11	1	0 595	7	4 16	48 1
Total	1 000	100	10	1[illegible]5	12 5	101	10 1	44	4 4	31	3 1	11	1 1	52	5 2	6	0 6	17	1 7	4[illegible]

Arthritis Cases

(1) Both knees effusion
(2) Both knees, both ankles effusion
(3) Both knees right ankle
(4) Both knees right ankle
(5) Both knees right shoulder, right ankle, metacarpo phalangeal joints
(6) Both knees plantar fascia
(7) Both knees right elbow, left shoulder
(8) [illegible]
(9) Both knees right ankle
(10) Both knees left ankle, right shoulder (Arthritis blennorrhagica)
(11) Both knees left ankle
(12) Both knees effusion
(13) Metacarpo phalangeal joints
(14) Both knees effusion
(15) [illegible]
(16) Both knees right ankle
(17) Both knees right elbow
(18) Both knees
(19) Both knees effusion
(20) Both knees plantar fascia
(21) [illegible]
(22) Left knee, left ankle, both wrists and plantar fascia
(23) Right knee
(24) Both knees with effusion, right ankle
(25) Both knees
(26) Right knee with effusion
(27) Multiple arthritis knees elbows and phalanges
(28) Multiple arthritis, knees and phalanges
(29) Left elbow left knee left wrist
(30) Right ankle
(31) Left elbow right knee
(32) Both knees effusion
(33) Right knee
(34) Both knees right shoulder
(35) Both ankles plantar fascia
(36) Right wrist
(37) Right knee effusion
(38) Left knee, right ankle
(39) Right wrist cervical vertebræ
(40) Both wrists, metacarpo phalangeal joints
(41) Right knee
(42) Right knee right hip, right ankle
(43) Metacarpo phalangeal joints
(44) Both shoulders

Invalided—

(1) Chronic urethritis third attack—refused treatment
(2) Chronic urethritis, three years duration
(3) Chronic urethritis—refused treatment
(4) Arthritis (No 1)
(5) Arthritis (No 5)
(6) Arthritis (No 10)
(7) Arthritis (No 12)
(8) Chronic urethritis, two years duration
(9) Chronic urethritis—refused treatment
(10) Chronic urethritis third attack
(11) Flat foot (No 31)
(12) Flat foot (No 33)
(13) Arthritis (No 22)
(14) Arthritis (No 24)
(15) Chronic urethritis second attack
(16) Urethritis flat feet (No 35)
(17) Arthritis (No 40)

Eye Cases

Conjunctivitis	4 cases
Iritis	2 "

A certain [illegible] and cases of chronic urethritis were f[illegible] several examinations and no certain [illegible] discharge. The neurotic [illegible] the patient was put to duty [illegible] not been included in our series. [illegible] which although gonococci [illegible] organisms were found and all these cases [illegible] lesions have been entered under their appropriate heading. It will be seen how exceedingly difficult it has been to make an accurate classification, as the different types must necessarily overlap.

As regards the various complications enumerated, *epididymitis* has been noted apart from *posterior urethritis* though obviously the former is merely a sequela of the latter. Under *posterior urethritis* is included acute and chronic prostatitis, vesiculitis and cowperitis.

In many instances more than one complication was present. For instance, practically all cases of orchitis have coincident posterior infection. We consider that it would give an erroneous impression if both these complications were logged and we have only noted the more obvious of the two. Again, stricture is merely a later stage of submucous infiltration and we have had to use our discretion as to how we should enter various cases. Old stricture cases who had no active signs of gonorrhœa on admission were treated in general surgical wards and are not included in this series.

It will be noted that out of a total of 6[illegible]2 first and fresh infections only 100 or 14·9 per cent. are stated to have used a preventative, but those individuals who used a Service outfit after a lapse of eight hours from the time of risk of infection are obviously applied it incorrectly, and are not included.

The preventative referred to is the ordinary tube of calomel ointment which is issued as a prophylactic for both gonorrhœa and syphilis. Although if properly used within a reasonable time it may be excellent for the latter disease, we do not consider it by any means an ideal prophylactic agent against gonococcal infection, and it is to be regretted that the tube of argyol jelly which was formerly included in the outfit has been abolished.

The vexed question as to whether the issue of preventatives tends to encourage promiscuous sexual intercourse is beyond the scope of this paper. From our statistics it is obvious that the Service prophylactic packages are far from infallible, and we think that medical officers should be careful to emphasize this point in their periodical health lectures.

On studying the statistical tables it would appear that treatment by vaccine and colloidal metals is at a disadvantage when compared with treatment by silver alone.

In point of fact, the more refractory cases, or those who did not

[illegible] under simple [illegible] vaccine [illegible] known might that [illegible] B and C [illegible] treatment [illegible] alone [illegible] But he [illegible] that out [illegible] well cases of [illegible]

Our [illegible] is that [illegible] use of [illegible] giving short [illegible] complete [illegible]

It will be [illegible] that [illegible] hospital [illegible] the [illegible] contact.

On [illegible] fifty-five [illegible] forty-eight [illegible] forty-three [illegible]

In the [illegible] from the [illegible] when [illegible] arthritis [illegible] cases [illegible]

Of the [illegible] definite [illegible] of the [illegible] infection [illegible] consequent [illegible] lead [illegible] before [illegible]

Infected joints. [illegible] in seventeen [illegible] cent. [illegible] treat them [illegible]

In the [illegible] found [illegible] had [illegible] 1922 [illegible] twenty [illegible] combined [illegible] latter [illegible] diphtheroid [illegible] treated with [illegible] usually [illegible] with [illegible]

The loss [illegible] figures [illegible] 14 cases [illegible] follicles [illegible] and [illegible]

[illegible] cases of chronic [illegible] were the most intractable of the [illegible] account for the [illegible] invalidings. In only 12 [illegible] was a definite causative [illegible] the persistence of the discharge discovered. In the remaining forty three the most careful scrutiny failed to reveal any gross pathological changes.

Posterior infection was found in 31 or 18 15 per cent., epididymitis in 35 or 20 83 per cent. arthritis in 19 or 11 3 per cent., peri urethral follicles in 4 or 2 22 per cent. submucous infiltrations in 18, or 11 11 per cent., with one case of iritis complicated with arthritis. Under this heading also we include 10 cases or 5 95 per cent of definite stricture.

The invalidings for the whole series were seventeen or 1 7 per cent. We have appended a list showing the cause for which the patients were brought forward for survey. It will be noticed that three men with chronic urethritis refused treatment. These were all examples of pinpoint meatus where it was impossible to carry out any instrumental treatment without performing the operation of meatotomy. In two cases of chronic urethritis we frankly could not clear up the gleet though gonococci were not found and it was thought best to bring these patients up for survey. Two men who constantly exposed themselves to infection without taking any precautions and were in consequence continually in and out of hospital were also disposed of in the same way as soon as they were bacteriologically clear. The remaining cases were invalided for arthritis; a detailed list of these is appended.

The very great majority of men do all they can to follow instructions and get clear of the disease. There are however a small minority who, having contracted gonorrhœa, regard their misfortune as a good opportunity of getting out of the Service. It is true that such men are of no use to the Navy but still invaliding them indiscriminately creates a bad precedent and also encourages others to refuse treatment in the hope of being dealt with in like manner.

Medical officers in charge of civilian venereal clinics often expatiate on the disadvantages they have to contend with. They justly point out that their patients have to carry on with their ordinary work even when in the acute stage of gonorrhœa, that their patients can only attend with difficulty at irregular intervals for treatment and in consequence many of them cease attending before they are properly cured.

In the Navy we also have our difficulties.

Only too frequently owing to the exigencies of the Service no sooner have we trained a sick berth rating to supervise treatment than he is draft'd to sea and replaced by a novice. We are supposed to keep a patient in hospital not only till he is bacteriologically clear but till he is [illegible] by [illegible] and we have to deal with a small class of men who conceal a [illegible] gleet until they are on draft for sea and then rush to the [illegible].

The majority of our cases would really be better out of hospital doing

a fair day's work and attending as out patients. They get "fed up" with hospital routine and some drift into an introspective neurasthenic condition and refuse to believe they will ever get cured.

Can it be wondered at that a young man who has been in hospital for possibly some months, and feeling quite well for most of the time, should celebrate his discharge to duty by imbibing too freely, and expose himself to the risk of reinfection when under the influence of alcohol?

We venture to make the following suggestions:—

(1) The sick berth staff should be allowed to specialize in venereal diseases under the same conditions as they are permitted to specialize in other subjects.

(2) Proper irrigating rooms should be fitted up in all naval hospitals. The facilities for irrigation, at any rate at Chatham R.N. Hospital, are inadequate and it is difficult to supervise patients.

(3) All acute cases should immediately be sent to hospital unless they occur in establishments which have adequate facilities for treatment. When acute symptoms have subsided they should be discharged to barracks and put on light duty, attending hospital as occasion requires. Such men should be allowed shore leave.

This last suggestion is open to the grave objection that disease would be even more widely spread than it is at the present time, but we consider that this routine would encourage men to report themselves sick at the earliest opportunity. It would obviate the present serious congestion in naval hospitals, and after all, when one considers the infective civilian population at large, a few naval ratings who would not play the game would be merely a drop in the ocean.

We should like to express our thanks to Sick Berth Petty Officers Day and Kendrick for their whole-hearted assistance during these investigations.

Naval Medical History of the War.

SURGICAL SECTION (*continued*)

[illegible] SURGEON REAR-ADMIRAL A. C. ABSCHUTT WHITTY, C.B., R.N. (Ret.)

PART II.—WOUNDS

[illegible] (Formerly of Field War Wounds. By Surgeon Rear-Admiral [illegible] R.N. (Ret.)

[illegible] (Formerly of War Wounds. By Surgeon Captain [illegible] R.N.

THE ANTISEPTIC TREATMENT OF INFECTED WAR WOUNDS

SURGEON REAR-ADMIRAL W. C. ANDREW, C.B., R.N. (Ret.)

[illegible] the [illegible] of war it became necessary to use the [illegible] wounds. Hitherto surgeons thoroughly trained [illegible] sterilization superseding [illegible] It was early recognized that the application of [illegible] wounds was usual fatal, it not infrequently [illegible] primary infection which was excessive [illegible] to secondary or mixed infections, or excess [illegible] rarely [illegible] efficient antiseptic treatment. A several methods of [illegible] and Pasteur was therefore necessary and the [illegible] surgeons and pathologists were busily directed towards the [illegible] the best [illegible] substance which would rapidly diffusible [illegible] structure without the tissues or interference with the defences [illegible] would inhibit bacterial growth. The [illegible] antiseptics which [illegible] in the previous days were found to be [illegible] in one or [illegible] pathogens. It is [illegible] that [illegible] in a [illegible] the [illegible] period [illegible] origin as [illegible] century [illegible] and is poisonous. As the result of careful clinical [illegible] trial many antiseptics were introduced each possessing the requisite chemical and pathological properties and [illegible] of application. The equipment of the Naval hospital [illegible] of wounds in action were quickly brought into [illegible] and the purpose of this article is to describe the [illegible] and regularly practised in the Naval Medical Service.

[illegible] surgery with the numerous antiseptic substances [illegible] during the war period is made. Only

[illegible] d by [illegible] mitted [illegible] exactly [illegible] through disinfect[illegible] and impossible [illegible] fraction [illegible] thousands [illegible] under which [illegible] such [illegible] had to [illegible] condition [illegible] the early stage [illegible] the wounds [illegible] with [illegible] for by this [illegible] tissue which forms [illegible] tental flora of the wound [illegible] capable of healthy reaction.

The rapidity and [illegible] all the means which [illegible] prevent the cause [illegible] of the germ of [illegible] with the wounds caused [illegible] the wounds were [illegible] fully and [illegible]

But [illegible] although [illegible] Chatham with [illegible] particularly those [illegible] supplied [illegible] Naval Division employed [illegible] and six days [illegible] many [illegible] lack of [illegible] by the [illegible] fall of the city [illegible] dressing with [illegible] prevent the [illegible] of [illegible] dealing with septic [illegible] out only in the way by [illegible] KCMG [illegible] who [illegible] or diminished [illegible] any part of the [illegible] separately [illegible] afterwards [illegible]

immediate antiseptic treatment of war wounds [1] This investigation conducted by a Committee appointed by Sir Arthur May, K C B the then Director General of the Medical Department of the Navy was carried out in the laboratories of the Naval Hospital, Chatham, and the Royal Naval College Greenwich The problem was to find a diffusible substance which would be applied at, or as shortly as possible after, infliction, and which would penetrate every part of the wound inhibiting bacterial growth until thorough disinfection could be effected in hospital Of the various substances tested, cresol and salicylic acid produced the best results, and appeared to be the most useful for the required purpose A cresol paste (20 per cent. in lanolin and wax base) and a powder containing equal parts of boric and salicylic acids ('borsal') were introduced The paste was issued in small nozzled tubes which could be introduced into the interior of a wound and the contents squeezed in various directions—some of it being also smeared over the surrounding parts The wound was then well dusted with borsal powder and the emergency dressing applied

Although excellent results had been obtained in laboratory infections, and also clinically in accidental wounds including compound fractures less success was met with in cases from the front This may have been due partly to the difficulties of time and place incident to war conditions and partly to imperfect application Successful cases were reported from the Gallipoli campaign severe gunshot and shell wounds remaining free from sepsis and healing readily [2] Excellent results from the application of a cresol or carbolic acid paste for the prevention of sepsis in wounds on board a battleship were reported by Surgeon Commander John Martin R N [3] Notwithstanding this, and partly, perhaps, from an over-eagerness to adopt some of the newer antiseptics which were then being introduced, the treatment was superseded by other methods, nor was it given the universal trial which it deserved

It was significant that in the investigation referred to the laboratory tests showed that iodine which in the early part of the war was extensively used for the disinfection of wounds at the front failed to inhibit bacterial growth

At Haslar a "Green Spray" introduced by Surgeon General Sir G Lenthal Cheatle K C B was extensively used It is composed of equal parts of 2 per cent malachite green dissolved in 80 per cent rectified spirit and water and 2 per cent perchloride of mercury dissolved in 80 per cent rectified spirit and water The mixture thus contains 1 per cent each of malachite green and mercuric chloride in the form of a compound $C_{23}H_{22}N_2Cl_4$ (Micklethwait) The bacteriological research and the satisfactory clinical results obtained were published in 1915 [4] Writing later, Sir Lenthal Cheatle thus states :—"The compound is easily dissociated and when it comes into contact with the tissues probably forms an albuminate of mercury and an albuminate of malachite green The malachite green is reduced by living tissues to the leuco compound and therefore becomes

[illegible] wound as a deposit and is slowly dissolved by the exudate and then exerts its antiseptic action [5]

The best method of application is by means of a spray Every part of the wound is thus reached by the mixture which is non-toxic to the tissues and can be applied to a mucous membrane It was largely used in infected wounds and proved an efficient germicide, steadily reducing the number of micro organisms and preventing secondary infection Its use was extended to bruise ulcers, boils and carbuncles and it was extensively employed in the sterilization of the skin before operations It stains the skin green and the area so treated is clearly defined

The Hypochlorites

The use of hypochlorous acid as an antiseptic came into great prominence during the war and chiefly in the form of eusol—a solution containing approximately 0 5 per cent of the acid was extensively employed both in the Service afloat and in the naval hospitals It was introduced after much experimental work by Lorrain Smith Murray Drennan, Rettie and Campbell It is a powerful germicidal agent, delays the development of bacteria and destroys their toxins It is non toxic to tissues and, being gaseous penetrates to all parts of the wound It is however, soon decomposed by contact with the wound secretions An interesting summary of its value as a dressing in septic wounds including those inflicted in action at the Battle of Jutland on Board H M S *Lion* was published by Surgeon Commander (now Surgeon Captain) A Maclean, D S O, M B, R N, and Surgeon Lieutenant Commander Horace E R Stephens, O B E M B I R C S R N [6] Its use was extended to the treatment of boils abscess, cellulitis and all conditions in which sepsis exists. It is certainly a powerful enemy to bacterial growth, but in order to maintain its action frequent application is required, for as stated in the article by the officers mentioned once the HClO is broken up there is nothing left ' And it breaks up quickly Consequently it was found that those cases did best in which the application was frequently renewed Septic flesh wounds of the extremities cleaned rapidly when immersed in eusol baths but in the case of compound fractures the frequent dressings necessitated by its use were often a dread to the patient and involved disturbance of the parts This however, was to a great extent obviated by a useful method of intermittent instillation first described by Surgeon Lieutenant Commander D F Wilkie O B E, F R C S, R N V R [7] It was based on the principle of Carrel s tubes, but less elaborate and provided for the frequent renewal and distribution of the antiseptic to all parts of the wound with the minimum disturbance of dressing The method was adopted with increasing advantage

[illegible]

[illegible]

The [illegible]—[illegible] of liquid into a soft [illegible] the result. The [illegible] liquid and [illegible] filled with [illegible]

[illegible] beyond can [illegible] contact [illegible] succeeded [illegible] the final [illegible] by a [illegible] intermittent [illegible] the latter the [illegible] This [illegible] surrounded by [illegible] and [illegible]

An [illegible] if [illegible] was published by [illegible] L. S. N. [illegible] by M. [illegible] mathematically [illegible] care [illegible] but [illegible] and [illegible] assumed

[illegible] possesses the [illegible] the sloughing [illegible] ground.

An important point to [illegible] clearly shown in the article [illegible] counter openings for the purpose of [illegible] escape of the solution and defeat the [illegible] in contact with the tissues. All [illegible] as possible, be opened from the [illegible] them into cavities in which the tubes [illegible] to avoid overflow of the fluid is [illegible] is particularly evident in [illegible] the hypochlorite rapidly splits [illegible] gauze dressing smeared with sterilized [illegible] was used for the purpose [illegible]

The Carrel-Dakin treatment [illegible] most successful methods of combating [illegible] striking and it enables secondary su[illegible] comparatively early date. This [illegible] bacteriological investigation. [illegible] pated sequestrum formation partial [illegible] the later dealing with the sequestrum.

The treatment was extensively used [illegible] uniformly successful. [illegible] Surgeon [illegible] B.Sc., R.N., in charge of the surgical [illegible] R.N. Hospital, Plymouth, expresses [illegible] remain the most generally useful [illegible] this is fully confirmed by Surgeon [illegible] Vidal C. Thorpe, C.B.E., R.N. [illegible] The testimony from Chatham [illegible] (now Surgeon Rear-Admiral [illegible] follows: [illegible] The liquid [illegible] in cases where sepsis is established—[illegible] prevents septic absorption and [illegible] suture at an early date. [illegible] treatment. Surgeon Commander [illegible] O.B.E., R.N., then in charge of the [illegible] thus: When sepsis is established all [illegible] free removal with the knife all [illegible] and foreign bodies removed. Carrel [illegible] are used until [illegible] suture is performed.

[illegible]

The treatment of infected [illegible] inaugurated by [illegible] Admiral [illegible]

the physiological saline [illegible] (0·85 per cent sodium chloride) and the hypertonic solution containing [illegible] per cent of the salt It was claimed that the latter solution in addition to arresting bacterial growth produced a lymphagogic action and set free a tryptic ferment for the digestive cleansing of the wound. This action of 'lymph lavage' was particularly useful in cellulitis Dressings were applied warm, very wet and covered with an impermeable tissue If the position of the wound renders it practicable immersion in a 5 per cent saline bath is the best procedure The bath should be intermittent to allow of the alternating lymphagogic and digestive cleansing action Extensive lacerated wounds with fracture caused by shell or bomb, were more recently packed with salt tablets wrapped in gauze folds the whole being covered with jaconet The tablets dissolve slowly and the full physiological effects are produced The method, however, usually causes pain for some hours If endured the dressing is undisturbed for two or three days provided the outer covering is moist from discharge showing that lymph flow is active.

Although based on most careful and elaborate physiological research, this method has been the subject of much controversy and, from the experience gained in the Naval hospitals, it is doubtful whether the clinical results were as successful as in other methods. At any rate, the reports are strongly in favour of either the Carrel-Dakin treatment—when sepsis is fully established—or Morison's bismuth and iodoform paste (to be described immediately) But there is no doubt that the hypertonic solution is a powerful cleansing agent and a stimulant to granulation growth and the value of normal saline baths and dressings towards this end is well known

Bismuth Iodoform and Paraffin Paste

The clinical results obtained by the use of a bismuth, iodoform and paraffin paste (popularly known as 'bipp') introduced by Professor Rutherford Morison [9], in septic wounds, including compound fractures led to its employment in the Naval hospitals with most encouraging and successful results Though a less powerful and less soluble antiseptic agent than the hypochlorites observation has shown that it maintains a continuous antiseptic action in the wound It excites a free exudation of serum does not interfere with phagocytosis and granulation tissue grows freely in contact with it The technique is well known and must be accompanied by the strictest surgical cleanliness The dressing can be left on and the wound undisturbed for days or weeks provided pain and constitutional disturbances are absent This is a great advantage—it saves labour dressings and much distress to patients Drainage is not required as the paste does not prevent the escape of any discharge A rise of temperature after the first dressing often occurs—but pyrexia unaccompanied by change in the pulse or aspect of the patient need not be a cause either for alarm or for disturbing the dressing.

Professor Morison after much disappointment in the treatment of septic wounds during the war came to the conclusion "that if it is possible to get to the bottom of an infected wound so that it can be thoroughly cleansed mechanically and suitable antiseptics be applied the wound can be closed at once with interrupted sutures always with impunity and many times with the prospect of finding it healed when the dressing is removed for the first time at the end of three weeks [10]

This fact has been abundantly proved clinically and establishes a new principle in surgery To close a septic wound by suture after thorough application of the "bipp" method and to find it healed on the removal of the first dressing is a triumph and where it has been extended to compound fractures and wounded joints the results have been marvellous There is no better treatment for bone cavities and fistulæ due to chronic septic osteitis These cases were very numerous and prolonged in fact it may be said that until recently, most cases of bone injury inflicted by shell or other projectile resulted in necrosis with consequent sinuses sequestra and cavities involving a long course of treatment and repeated operations resulting only too often in disappointment to patient and surgeon A thoroughly radical operation must be done sinuses excised sequestra removed and the bone cavity widely exposed by chipping away its roof and overhanging walls and curetting the interior until a healthy vascular surface is reached The "bipp" treatment is then applied strict attention being paid to all the details in technique The external wound can be closed and firm healing may be expected Should there be much tension on the skin flaps, relaxation incisions are necessary and any tendency to œdema with consequent sloughing is diminished by scoring the skin in the wound area Small bone cavities will heal by simply filling with the paste ("bipp" stimulates osteogenesis and combats any infection left in the wound) Larger cavities heal more quickly if, after the application of the paste they are filled with grafts of fatty tissue which is gradually replaced by bone This treatment of chronic bone sinuses and cavities promises to supersede all other methods and the excellent results obtained fully justify its adoption

It must be remembered that the constituents of "bipp" if freely absorbed are toxic In the British Army in France the paste was extensively used Many cases of toxæmia occurred probably from its too liberal application Professor Morison attributes this dangerous absorption either to mistake in technique or to the use of a faulty paste So much depends upon its quality and consistence Improper preparation impairs its efficiency But with the exercise of care and the use of a properly prepared paste (any excess being removed from the wound) toxic effects are not likely to arise and they certainly should not weigh against the immense advantage of its use Although extensively employed in the Naval hospitals no cases of actual poisoning are reported

Amongst other antiseptics produced during the war mention need only

the mode of [illegible] [illegible] [illegible] [illegible] [illegible]). Its [illegible] properties were [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] a [illegible] saline. It [illegible] [illegible] [illegible] [illegible] to the Naval Service for certain cases [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] rapid cleansing and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] as an [illegible] [illegible] dressing [illegible] [illegible] [illegible]. It [illegible] useful solution for [illegible] of cavities and [illegible] [illegible] [illegible] [illegible] the wound before [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

It [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] treatment of wounds [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] marvellous. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the wound and [illegible] [illegible] [illegible] [illegible] [illegible] pathologist new [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] of sepsis and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] successful that [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] war work but that [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] injuries in service and [illegible] [illegible].

I [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] by the following [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] on the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Surgeon [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] O.B.E. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] R.N.

[illegible]

THE GENERAL EARLY TREATMENT OF WAR WOUNDS.

By Surgeon [illegible] STANLEY [illegible] BURN

In the early days of the war we were faced with a prevalence of sepsis and putrefaction, gangrene therefore not being important. It was a rule to amputate. Something had to be done. Early excision was widely practised and generally adopted. On the strict basis of the rule of implacement of strong antiseptics we expected to inhibit the most sepsis. In the other, strong antiseptics were found is useless alone to control bacterial growth and permit only slight sepsis. The wounds were thoroughly opened up, foreign bodies removed and tissue damage precised. My experience in H.M. Hospital Ship *Dunluce Castle* in October 1914 led me to adopt this method of treatment (see JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE, 1916).

The first of the above methods proved to be disappointing, the second was inadequate. Wilkie in *Hughes's Medical Journal* (1919) credits the open method with the saving of many lives, but recognizes that it is by no means an ideal form of treatment, as it leads to a slow healing with deep cicatrization, leading often to impairment of function. With a better understanding of the nature of wounds caused by modern projectiles together with a fuller knowledge of the bacteriology of wound infection there has arisen a desire for treatment—especially among French surgeons—towards a primary suture when circumstances are favourable for carrying out the high exciting and often lengthy operation of preparing the wound for closure. It is fully recognized that with the exception of the simple-tissue, fresh bullet wounds, the tissues lacerated by high velocity projectiles extend far beyond the visible tract, and the tissues and cells to be amputated is in any instance a serious one. There is to be reckoned as a more dangerous foreign body than any bullet or shell fragment, or other extraneous material, found in all such deep tissues, and especially in muscle, is the micro organisms of fatal sepsis which are practically certain to be introduced into every wound in modern warfare, as the Western Front grew with astonishing rapidity. It is therefore imperative that this foreign body should be removed before primary suture is attempted. Fragments of clothing, since they are certain to be infected, and torn skin fragments and well planes, once particles of dead muscle are also likely to be entangled in their crevices, must be removed.

It was realized that there had been laid in the wound a bacterial invasion, that this bacterial invasion and infection was to be dealt with by antiseptics alone. It was then learnt that the real cause was to be found in the dead tissues which were contaminated by clothing and foreign bodies left in the wound. It was also found that gas gangrene was so prevalent in the war, that the dead tissue

[illegible] pies were [illegible] is less and the free [illegible] of the wounds with the [illegible] of foreign bodies was not sufficient Attention then turned to the [illegible] removal of the devitalized tissue

[illegible] operative treatment is a true prophylactic method and possesses all the advantages of such Its fundamental form is wound excision, which not only removes the source of infection mechanically but also increases the tissue resistance Its effect upon the tissue resistance, is not produced so much by the removal of dead tissue which favours bacterial growth, and hinders permeation of the protective lymph stream as that it promotes the lymph flow In order to render such a procedure possible the treatment of the wound must be so thorough, that after it has been carried out, the natural processes are quite able to deal with any infection remaining the whole responsibility rests upon the operative procedure, and upon its ability to bear this responsibility rests the answer to the question as to whether conservative or operative treatment should be the method of choice However well the operation may have been performed one has to consider the ability of healthy tissues to deal with a limited amount of infection provided the greater sources of bacterial growth have been removed Further, the action of antiseptics in destroying or retarding the growth of bacteria is still present after operation

From these remarks it can be inferred that one is not content in the early treatment of war wounds to rely upon antiseptics alone, or sterilization of the wound by the knife alone It is a combination of these two methods which experience has taught must be adopted and rigidly carried out Many antiseptics have been used but "Dipp, introduced by Rutherford Morison seems to have given the best results When the wound has been so treated, it may be sewn up constituting primary suture

Bacteriology

The examination of gunshot wounds received in the field show that they very frequently contain organisms of a more or less virulent nature Of these organisms the most common are *Bacillus aerogenes capsulatus* (*B perfringens*) streptococci, staphylococci *B tetanus* and Gram negative bacilli There may not always be time or opportunity to make a bacteriological examination of wounds before operation but when this can be done it is of the greatest assistance to the surgeon enabling him to decide between primary and secondary suture

X Ray Examination

Wherever it is possible an early examination should be made before [illegible] success may depend on the complete removal of all foreign [illegible]

(To be continued)

Clinical and Practical Notes

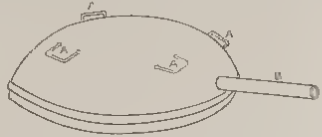
AN IMPROVISED SUPRAPUBIC DRESSING

By Surgeon Commander T. T. Jeans, C.M.G., M.B., R.N.

On January 19 of this year I operated on an officer's steward of H.M.S. *Wallflower* who had already been invalided but suffered such great discomfort from two large vesical calculi as to be quite unfit to travel to England.

Owing to the condition of the bladder the incision in its wall could not be closed at the operation and drainage had to be made, in the usual manner, through a large tube. On the removal of this tube four days later urine still passed through the opening and had to be drained away. This hospital does not possess either an Irving's or Cole's suprapubic dressing, so I improvised two out of the top and bottom of a circular celluloid soap box.

The diagram, roughly half size, shows one of the completed dressings.



A. Wire loops passed through box for attachment of necessary tapes.
B. Glass tube passed through rim of box, flanged inside and cemented in position. Drainage tube fitted to outer end.

Wire loops and tube were cemented with liquid glue covered with plaster of Paris made with gelatine.

Imbedded in a thick layer of collodion and held in position by the necessary tapes these dressings acted admirably for the two days they were required.

Total cost—one shilling and sixpence.

THE TREATMENT OF SYPHILIS ON BOARD SHIPS

By Surgeon Commander R. H. McGillivray, O.B.E., M.B., R.N.

The treatment of syphilis on board ships is advocated by Surgeon Commander Kilroy (Fleet Medical Officer), H.M.S. *Iron Duke*, and as carried out systematically in the ships of the Mediterranean Fleet has been described by the author in articles published by him in the July and October numbers of the Journal (1919).

As an addendum to these papers Surgeon Commander Kilroy has asked me to publish the results obtained on board *Iron Duke*.

Though the numbers are still small it may be of interest to compare the results in the two ships and to note the high percentage of negatives obtained in positive cases after the first course of treatment given on board. In order to more [illegible] compare these results I tabulate them exactly as in *Iron Duke* in the October 1919 number of Journal, "Immediate Results of One Unit Course."

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Late W after [illegible]	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]		[illegible]	4
	[illegible]	[illegible]		[illegible]			1
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible] A B [illegible]	[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible] A B Aug [illegible] [illegible] A B Aug [illegible] [illegible] A B Dec [illegible]		[illegible]			1
	[illegible]	[illegible]		[illegible]	[illegible]		4
	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
[illegible]	[illegible]			[illegible]			
[illegible]	[illegible]	[illegible]		[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]		[illegible]			

[illegible]

[illegible]

[illegible] the form [illegible] against [illegible]

[illegible]

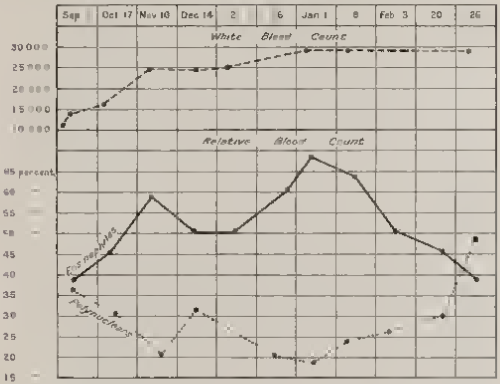
[illegible] INFECTION IN AN EUROPEAN

[illegible] A. BASSETT SMITH, K.C.B., C.M.G.
[illegible] R.N. (Ret.)

[illegible] on [illegible] on this infection by Surgeon Commander Pinton which appeared [illegible] Commander Pinton for [illegible] following notes made at Hankow in 191[illegible] of interest.

The case is that of a [illegible] aged 24 who was serving in a [illegible] the Yangtse.

History. While at Hankow [illegible] 1911 he with four others went for a picnic to [illegible] Creek [illegible] flooded area, the water being clear but not deep.



All subsequently were attacked with fever and so called "blood worm disease" two so severely that they returned to England, while two mildly attacked remained at Hankow.

Following the fever the patient suffered from constipation and neuralgia and became anæmic and thin. In September a marked eosinophilia was present and the liver was slightly enlarged. At Yokohama Hospital large ova containing embryos were found in the stools and the blood content was very abnormal, a decrease in red cells with a great increase of eosinophils.

On arrival in England in December six months after the onset of the symptoms he was sallow in appearance somewhat emaciated, the liver slightly enlarged, but the other organs normal. The bowels were constipated but the

stool [illegible] beyond some debility and [illegible] there were [illegible] He was treated with [illegible]

[illegible] still (March 1, 1912) keeps [illegible] 68 per cent have now [illegible] proportionately [illegible] case was described [illegible] Lect 16 1908 [illegible] believe unique which [illegible] greater interest [illegible] persisted [illegible] year

Reviews.

[illegible] By L. Rimsky Dawson [illegible] L.R.C.P. Lond [illegible] of the Council [illegible] Obstetrical Society of [illegible] Royal Society of Medicine [illegible] Resident [illegible] to the Westminster Hospital [illegible] Third Edition [illegible] 1921 [illegible] With 27 illus [illegible]

[illegible] D. Rimsky Dawson's monthly model—to give it [illegible] The [illegible] Man's New Theory [illegible] Chapters on [illegible] Production of [illegible] Sex at Will [illegible] has been [illegible] in the text. This [illegible] not only because we have become [illegible] but also because we find the text so [illegible] before the reader in a carefully [illegible]

[illegible] of importance and of intense interest [illegible] in a manner [illegible]

[illegible] the possibility of predicating the sex [illegible] regulated so that [illegible] as the author claims to be able to do [illegible] (the 0 per cent of females [illegible] in which month her confine[illegible] type of ovulation instead of the usual [illegible] to have proved his theory [illegible] to the objections that might be [illegible] practical man takes pains to elucidate [illegible] conflicting conditions he has had [illegible] logic but provides what must [illegible] in a review of the normal [illegible] very full details [illegible] the interested in the subject [illegible]

[illegible] this book to their office of all practitioners [illegible] or get the [illegible] information so as to be [illegible] doctor alike

[illegible] The [illegible] DIAGNOSIS [illegible] TREATMENT [illegible] GONORRHŒA A Handbook of [illegible] relation [illegible] the Community By Sevill [illegible] Thy [illegible] M A Cantab M R C S L R C P [illegible] Introduction by [illegible] M D London John Bale [illegible] Dreadnought, Ltd [illegible] 177 Illustrated with 11 [illegible] 9 other plates [illegible]

The book [illegible] with the description [illegible] syphilis. The authors advocate [illegible] by the combination of [illegible] arsenobenzol compounds In emphasizing the great importance of [illegible] early diagnosis and prompt treatment in syphilis comment is made upon the [illegible] of unanimity shown amongst writers in their choice of the ideal [illegible] treatment The authors largely ascribe this difference of opinion to [illegible] value of the salvarsan series of drugs to abort the disease in any but early [illegible] The chapter on Latent Disease and Marriage contains a useful [illegible] The sections on gonorrhœa in the male and in the female contain a useful [illegible] of modern methods of treatment and there is a valuable chapter on the [illegible] by Mr Wyndham Powell Part I which includes the [illegible] is a special section on Gonorrhœal Affections of the Urinary and [illegible] Bacteriology

Part II deals with the Sociological and Administrative [illegible] and contains amongst other chapters an important one on [illegible] of the medical man to patients in [illegible] dispensaries

The appendices contain valuable notes on the [illegible] a specimen health [illegible] in relation to immediate self disinfection [illegible] and measures for the making of time [illegible] Appendix IV [illegible] restriction of prostitutes and Appendix V gives the relative bill [illegible]

An addendum on the treatment of syphilis brings this [illegible] date with the latest standards [illegible] at the time of going to press The illustrations are numerous well chosen and clearly [illegible]

We have no hesitation in recommending to our readers the [illegible] practical work, which will be as helpful [illegible] of native service before [illegible]

THE PRACTICE OF MEDICINE IN THE TROPICS By [illegible] W Byam, O B E Lieutenant Colonel R A M C (ret) [illegible] D S O M D Edin Major R A M C (ret) Vol I Oxford Medical Publications London Henry Frowde and Hodder and Stoughton [illegible] Pp xxii + 855 331 figures 30 plates Price [illegible]

This is the first published of three large volumes on Tropical Medicine [illegible] work is intended to cover all that the medical practitioner should know [illegible] require Diseases even if not peculiar to the tropics [illegible] to climate Nowadays when all the recruits have [illegible] it is realized that it is impossible for one man to [illegible] this nature This book is compiled by seventy eight [illegible] recognized experts on the subjects they deal with

The volume under review contains six sections [illegible] is especially good Much emphasis is placed [illegible] cheaply from local material and which may [illegible] various devices are clearly explained with the help of [illegible] clear diagrams Section 2 on Nursing gives [illegible] ment of patients in hot climates—the sort of [illegible] tropics knows nothing about and often has no [illegible]

Section 3 treats of Entomology This section [illegible] illustrated Considering the growing importance of the [illegible]

[illegible] defects not paling [illegible] might have [illegible] perhaps they [illegible]

[illegible] this deserves high [illegible] comparatively small [illegible] of pathological [illegible] included. The Colour [illegible] is quite [illegible] of pathological [illegible] illustrations [illegible] Plate XXII [illegible] work.

[illegible] Sticks [illegible] In these [illegible] the sections is [illegible] chapter on the identification of Poisons and [illegible]

[illegible] of this volume deals with almost [illegible] of seldom recognized, fact that [illegible]

[illegible] carefully paragraphed the illustrations in the [illegible] the coloured plates could not be improved [illegible] that the plate of the Indian cobra [illegible]

[illegible] doctors who are expected to perform [illegible] a knowledge of medicine and often with no one [illegible] almost a necessity [illegible] the high standard of excellence of the first, [illegible] the practitioner in the tropics [illegible] congratulated on the contents and [illegible]

[illegible] Parasites [illegible] By R. Tanner Hewlett, M.D. [illegible] Medical Officer of Health and [illegible] London. [illegible] 1921. Pp. [illegible] 15 charts and 5 diagrams in the text. [illegible] 18s. net.

[illegible] which [illegible] price with published the authors [illegible] the generally accepted one in writing [illegible]

[illegible] will be found by readers that [illegible] medicine have [illegible] The principles [illegible] described and [illegible] may apply both to the [illegible] the general practitioner of [illegible]

The authors devote [illegible] the health problems of [illegible] and welfare [illegible] to those of general [illegible] present the [illegible] the diseases [illegible] This [illegible] will be [illegible] presently stands and they [illegible] two notes on the [illegible]

[illegible] milk and its [illegible] the very [illegible] theories as [illegible] well [illegible] strongly [illegible] many [illegible] of [illegible] diseases [illegible] book on the [illegible] health [illegible]

And [illegible] part of the book will [illegible] into the difficulties.

Valuable appe[illegible] present in noticeable [illegible] health satisfaction. This [illegible] particular [illegible] group [illegible] The book [illegible] completed or [illegible] than usually [illegible] Well doctors could [illegible] it to [illegible]

Abstracts.

Warsaw (I. M. [illegible]) Some Recent Observations [illegible] Experiments with Produced Urine Poisons [illegible] January 1902 [illegible]

In the study of the etiology of herbert [illegible] the importance [illegible] the most [illegible] symptom [illegible] the [illegible] the [illegible] disorder [illegible] into metabolism [illegible] poisons [illegible] fibres [illegible] starvation [illegible] depends [illegible] suprarenals [illegible] for the synthesis [illegible] nucleus [illegible] B. [illegible] the latter [illegible] system [illegible] to [illegible] short of [illegible] follows [illegible] to the [illegible] tolysis [illegible] starvation [illegible] Kellaway [illegible]

In some [illegible] of toxic [illegible] symptoms may precede [illegible] in the nerves [illegible] represent the total [illegible] as thought by Vellis [illegible] to [illegible] the [illegible] that nerve [illegible] the [illegible] to recognize the [illegible] pathological conception of [illegible] in the body through [illegible]

I. W. B.

OGATA (TOMOSOBURO) Report upon Beriberi (Kakkeshinrikio Kenkyu or Polyneuritis gallinarum) Reprint from *Verhandlungen der Japanischen Path Gesellschaft* April 3 1920, pp 75

The author first gives a short historical sketch of experimental studies by different investigators from which it was apparent that no agreement as to the causative of *polyneuritis gallinarum* had been reached He first studied the symptoms and pathological anatomy of rice disease A turn pre[illegible] to those in general use as compared with birds fed on other sol[illegible] the object being to elucidate the disturbances of metabolism caused by protein [illegible] these of rice disease Most carbohydrates produced typical [illegible] symptoms also gave rise to diarrhœa and cachexia thus complicating [illegible] The proteins used were egg albumen and horse flesh or vegetable [illegible] fed on sea beans hemp in the antipelagic at 180° C for two [illegible] This product of dietary oil produced a nephritis and many birds died of [illegible] All rabbits fed on fat died in a short time all therefore apparent that [illegible] Heavy be produced by carbohydrate feeding protein disease being [illegible] also the continual malnutrition brought about by starvation [illegible] but is he said that the relative period did not bear any con[illegible] to the loss of weight but loss of weight could not be hundred [illegible] of the disease because unperfect alexeropsen occurred and [illegible] of rabbits The incubative period of rice disease [illegible] and inversely as the amount of rice eaten [illegible] was twenty seven days with rice feeding forty two days [illegible] rabbits proteins corresponding amount of vitamine B [illegible] these are mainly extract together when the latter is lacking [illegible] fed on barley or oat according to the amount of [illegible] and the stomach disease appears Generally [illegible] which may be prolonged by giving small [illegible] B the pulse temperature and respiration are all lowered [illegible] resembles of Kin emo the respiratory quotient falls from [illegible] and digestive disturbances were common [illegible] The urine showed the presence of sugar on the first [illegible] after the onset of the symptoms urines are [illegible] have connected The author looked [illegible] of the red cells but rapid drop in the red count [illegible] changes in the shape and colour of the [illegible] was observed in starvation anæmia The blood [illegible] of the carbohydrate feeding then remains [illegible] the rise when it rises rapidly the normal rise [illegible] after which a tolerance is established [illegible] Albuminuria not seen in lions but there was a [illegible]

[illegible] changes it is noted that forced feeding causes [illegible] and [illegible] is not caused by rice disease In [illegible] days and animals increase in weight [illegible] with rice and yeast while the spices [illegible]

[illegible] disease is only produced by carbohydrate [illegible] it is not so equally in protein [illegible] in mouse or rabbit (B) but polyneuritis [illegible] different causes and diabetes in man, [illegible] rice disease are not the nerve changes [illegible] in degenerative changes in the ductless [illegible] to take part in carbohydrate metabolism The islands [illegible] hypertrophied and their function increased this only [illegible] the symptoms show given increased damaged on those

cells where [illegible] diseases [illegible] The increase in the adrenals may be a compensatory hypertrophy [illegible] is a hypertrophy and hyperplasia of the [illegible] particularly of the medulla [illegible] it is doubtful if there is an increase [illegible] it appears that these changes are associated with those in the pancreas [illegible] increased injection of the adrenal cortex is compensatory as it does not [illegible] after the onset of the disease and vitamin B is essential to get [illegible] hormones of these glands to carry out adrenal secretion.

If vitamin B is wanting hypertrophy may go on to atrophy which [illegible] seen in the pancreas of hens which had been given the disease three [illegible] raises the question whether chronic lack of vitamin B with excess of [illegible] might not ultimately cause diabetes. The findings as to the respiration show that the carbohydrate is not completely broken down to CO_2 [illegible] of vitamin B on the other hand the excess increase in the urine [illegible] disease begins, thus showing that protein continues to be oxidized even in [illegible] quantity than before in an attempt to compensate for the lack of energy [illegible] from the carbohydrate. Thus oxygen continues to be absorbed while CO_2 [illegible] excreted correspondingly. Hyperglycemia and glycosuria appear when [illegible] falls and at the same time a diminution of the glycogen content of liver and [illegible] in pancreatic diabetes.

In the authors' observations there were many features constantly [illegible] rice disease which hardly ever occur in human beriberi: the relationship [illegible] diabetes further and rice disease is a very interesting one and requires [illegible] study; the latter the author terms as a disturbance of carbohydrate [illegible] caused by the intake of carbohydrate with insufficient vitamine B the latter [illegible] absolutely necessary to proper carbohydrate metabolism. P. W. B.

Ledingham (J. C. G.), Weldon (M.), Smith (L. F.) and Murray (J.). The Virulence of *Bacillus abortus* and *Bacillus melitensis* for Monkeys. Studies from the Genus Brucella. No. 6. [illegible] Journ. Hygiene, Dec. 1918, vol. xxix, No. 5, pp. 463–[illegible]. With 1 chart in text.

This is a communication of previous work to show the relation of the [illegible] Bang with *B. melitensis* (Evans, the authors' non-cultivator). A few [illegible] have been carried out on monkeys; these were used for the experiments [illegible] results of infection being observed in the various [illegible] the organs [illegible]. The work done is fully described in full details are given.

The cultures of *B. abortus* were pathogenic to guinea-pigs and [illegible] separated from the individuals gave a morphologically cultural [illegible] tests. Intravenous injections in one case gave rise to a typical infection [illegible] others were less conclusive. When injected into [illegible] the *B. melitensis* virulence in the first three tests was the infectivity [illegible] guinea-pig, an outbreak of osteomyelitis—which in health [illegible] though guinea-pigs fed on the stock culture [illegible] higher the virulence of the strain the quicker [illegible].

Artificially infected cows milk [illegible] negative results. Goats were infected and [illegible] injecting into the udders. Four goats [illegible] stream and the milk used for feeding [illegible] experiments it appears that *B. melitensis* [illegible] which also fed on naturally infected goats milk [illegible] which did not become infected [illegible] organisms given on carrots were successful. The [illegible] be infected in the alimentary canal by [illegible] when the diet was continued for one [illegible] before *B. melitensis*. A fact of great epidemiological [illegible] which are exposed to infection during the [illegible]

[illegible]

[illegible] pathogen [illegible] though [illegible] and one [illegible] pulmonis [illegible] authors [illegible] gatur [illegible] exanthematicus [illegible] results [illegible] as follows: (1) [illegible] of [illegible] the [illegible] monkeys [illegible] laboratory infections [illegible] are [illegible] that which will [illegible] tion of [illegible]

P. W. B.

[illegible] Pappataccheber [illegible] *Zeitschr.* 1940 1941 [illegible] text [illegible]

[illegible] the disease the author points out that [illegible] Dardanelles [illegible] the Germans [illegible] and in Asia Minor in spite of the [illegible] With regard to the etiology [illegible] complete [illegible] as put forward [illegible] acknowledged the [illegible] Dardanelles for a number of 1916–1917 [illegible] the [illegible] Asia Minor is given and the [illegible] of the east concerning [illegible] is [illegible] given in considerable [illegible] Except of the Dardanelles [illegible] is provided. It is [illegible] other [illegible] by the strong winds [illegible] the higher regions. During [illegible] suffered severely in [illegible] either through [illegible] have had in certain [illegible] one of thirty-eight [illegible] after his [illegible] dark [illegible] a great deal. It [illegible] that [illegible] of short duration [illegible] and in [illegible] through [illegible] national [illegible] twelve [illegible] was next brought [illegible] as [illegible] In 1916 from a [illegible] cases but [illegible] infection is [illegible] but in Lyl before [illegible] laboratory findings [illegible] with [illegible]

P. W. B.

MEGAW (H. W.) [illegible] A Typhus like [illegible]
Tick [illegible] October [illegible] pp. [illegible]
several [illegible]

In this [illegible] article the author [illegible] has fully [illegible] the obscure [illegible] fever found in the Himalayas [illegible] particularly in Bhot [illegible] Sal Tal 4,000 ft. upon the Kumaon [illegible] compares it with other typhus like fevers which have been [illegible] various people [illegible] widely separated. He first gives a brief [illegible] unpublished [illegible] Dr. C. Lord McKechnie of the fevers observed [illegible] the same [illegible] which in the end he was reluctantly convinced [illegible] of typhus and were not parotyphoids. The author then discusses [illegible] by himself, Spencer Hardy and others including his own. He [illegible] forward strong arguments and proofs that the Kumaon fever has [illegible] ship with Rocky Mountain fever and is probably conveyed by [illegible] there was good evidence in his own case and much epidemiological [illegible] others. The disease was but little infective; mites were frequently [illegible] virulence was slight, but the fever generally lasted about two [illegible] pashmina [illegible] dry blanket. It is most often mistaken for some [illegible] but in recorded experiments the specific agglutinins have been [illegible] absent for these organisms. The author gives the following [illegible] classification:—

Typhus Group

Louse typhus	Tick typhus	Mite typhus
A. Louse disease of filth, crowding, poverty—	A. Disease of open air life in wilds—	A. Disease of recent [illegible] places—
1. Severe typhus, mortality high	1. Rocky Mountain fever (1) Montana type, high mortality 60 per cent (2) Idaho type, low mortality 15 per cent	1. Tsutsugamushi, high mortality up to [illegible] per cent
B. Mild typhus or Brill's disease, mortality low	B. Tick typhus of Kumaon and other places of India, low mortality about 5 to 10 per cent	B. Sumatra tick typhus, low mortality
C. Tarbadillo or Mexican typhus	—	—

On the determination of the carriers which spread the disease every thing with regard to prophylaxis depends. If the theory is true that it is a disease affecting animals of the jungle conveyed to man by ticks and with a similar etiological factor to that of the Rocky Mountain fever, then further research work on these lines is urgently required and precaution against tick bite infection are worth carrying out with the extermination of the mammalian host which has been found so successful in the Rocky Mountains.

The paper should be carefully read by all interested in the subject.

P. W. B.—S.

Preparations, &c.

DIAL[illegible]OLEN AND LIPOIODINE—CIBA BRAND

(London [illegible] Clayton Aniline Company Ltd., 68½ Upper Thames Street E.C. 4.)

Dial[illegible]olen (diallylbarbituric acid) is a powerful hypnotic valuable in nervous [illegible]. It is [illegible] phenemally to veronal (diethylbarbituric acid) but [illegible] the same hypnotic effect is much smaller and unlike [illegible] taken up in the system therefore causes [illegible] accumulation.

[illegible] tablets containing 1½ gr. each tablet is grooved across the [illegible] into two equal parts. 1½ to 3 gr. is usually [illegible] sleep within half an hour but the dose may be pushed to 3 gr. [illegible]

[illegible] tane obtained from blood platelets is a light brown [illegible]. It is supplied in sterilized ampoules containing 1.5 c.c. [illegible] for dental use and for the treatment of small local [illegible] tablets containing sodium chloride for preparing 1 per cent [illegible] and in powder form for dissolving in normal saline to [illegible] solutions required for intravenous subcutaneous and intra[illegible]

[illegible] particularly useful for arresting paronychia [illegible] supplied locally in a 5 per cent or even stronger solu[illegible] pad of gauze. The solution may be sterilized by [illegible] serviceable for arresting persistent oozing after [illegible]

[illegible] administered in the form of alkaline iodides is so frequently [illegible] symptom that many organic compounds containing it [illegible] avoiding the trouble if possible but most of them have a [illegible]. The Clayton Aniline Company have now put forward [illegible] derivative of a fatty acid ethyl di-iodohaemate. It is [illegible] of assimilable iodine and not being decomposed [illegible] gastric disturbances also although readily [illegible] its dissociation is so slow that the full therapeutic [illegible] is obtained without any risk of iodism.

[illegible] and in 5 gr. tablets. For external use when di[illegible] is readily absorbed through the skin.

[illegible] BRITISH MEDICAL AND SCIENTIFIC GLASSWARE COMPANY LIMITED

([illegible] Bateman Street W.1.)

We [illegible] to us samples of glass syringes and hypodermic [illegible] which compare favourably with any similar [illegible] of [illegible].

It is [illegible] note that the manufacture of these syringes [illegible] long monopoly is being so satisfactorily [illegible].

The [illegible] are and the bore is regular.

The [illegible] especially is of excellent workmanship and finish.

News of the Service.

HONOURS AWARDED

[illegible] to grant orders for the [illegible]

[illegible] Division of the Third Class [illegible]

[illegible] MAYO, R.N.

[illegible] OF THE [illegible] OF ST. JOHN IN INDIA

[illegible]

The [illegible] the following [illegible] the Hospital [illegible]

As Re[illegible] Brevet Lieut. [illegible] M.B., B.S., M.R.C.S.

Surgeon L[illegible] Diploma [illegible] Lieut. and [illegible]

Surgeon [illegible] M.B., and [illegible] have passed [illegible] the Compound [illegible]

PROMOTIONS

Surgeon [illegible] M.B. [illegible] has been promoted to Surgeon Rear-Admiral [illegible]

Surgeon [illegible] M.B. [illegible] has been promoted to Surgeon [illegible]

Surgeon [illegible] M.B., M.D. [illegible] has been promoted to Surgeon Commander [illegible] M.B., B.S., M.R.C.S. [illegible] December 31 [illegible]

Surgeon [illegible] M.B., B.S., M.R.C.S. [illegible] has been promoted to Surgeon [illegible] dated [illegible]

Surgeon [illegible] M.B. has been promoted to Surgeon [illegible] March 21 [illegible]

ROYAL NAVY MEDICAL CLUB

ANNUAL DINNER

The Annual Dinner will take place at the Trocadero Restaurant (Rule [illegible]) on Thursday, April 27, 1922, at 7.30 p.m. for 8 p.m.

Members who intend to dine are requested to inform the Honorary Secretary, Medical Club, Medical Department, Royal Navy, 68, Vincent Street, S.W.1, and not later than seven clear days before April 27, 1922.

NAVAL MEDICAL COMPASSIONATE FUND

Account of Receipts and Payments for year ending December 31, 1921

	£	s	d	£	s	d
[illegible] January 1 1921						
[illegible]	159	0	0			
[illegible]	167	2	6			
				0[illegible]	2	2
[illegible]	205	0	6			
[illegible] Stock	95	0	0			
				300	0	0
[illegible]				[illegible]	17	[illegible]
				[illegible]	[illegible]	[illegible]
				110	11	0
				£1 068	11	8

Awards to Orphans and Widows			
Secretary's Allowance			
Auditor's Fee			
Messengers Allowance			
Subscription returned			
Cost of Transferring Stock to New Trustees			
Balance at Bankers December 31 1921			
Current Account	£[illegible]	[illegible]	[illegible]
Deposit Account	[illegible]	[illegible]	[illegible]
	£1 068	11	8

[illegible] the Accountant and Comptroller [illegible] Auditor has been [illegible] £[illegible] 18s 6d being [illegible] £[illegible] of which [illegible] on Bank Deposit [illegible] Bank of England in [illegible] December 31 1921 is attached [illegible] £36 18s are outstanding.

(Sd.) A. C. HAYWARD
Auditor

In addition to the above Cash Balance stock to the [illegible] amounts were standing at the Bank of England in the names of the Trustees [illegible]

£10 000	2½ per cent Consols	
£3000	5 per cent War Loan Stock 1929 1947	
£400	5 per cent National War Bond	

Original Balance Sheet (5) of the Fund — Certificate [illegible] Statements of Accounts [illegible]

(Sd.) F. SUTTON *Surveyor General of Supplies and Transport*

ADMIRALTY ORDERS ISSUED FROM DECEMBER 15, 1921, TO MARCH 15, 1922

(Only the more important Orders pertaining directly to the duties of the Medical Officer are all of them and not confidential are included.)

*412.—Washing Linen for the Sick Bay—Payments to Naval Ratings

(N.P. (D.) 1605.—29.12.1921.)

For six months from the date hereof the following maximum rates may be paid for washing employed in washing articles of Sick Bay Linen:—

Antiseptics	2s. per dozen
Sheets	2s. "
Pillowcases	1s.
Bedcovers	2s.
Towels	1
Cuscoids	1s. "
Blankets	6

(2) The work should be done by preference by the nominal share of the ship's company whenever practicable.

(3) In exceptional circumstances where the Commanding Officer is satisfied that washing rates do not sufficiently remunerate the washing, he may grant to the laundress the cost of the material used, but in no case may the payment exceed the rates specified in the table above. If the laundress explains that she is unable to do the work for the Cash Vouchers.

(This Order will be reprinted for posting on Notice Boards.)

14.—Hurt Certificates—Injuries sustained by Officers and Men while participating in Games or other Physical Exercise

(C.W. 17987.—6.1.1922.)

In future the following injuries sustained by Officers and men during training or while participating in games or other physical exercise will be considered as being in the meaning of Article 1318 of the Regulations, and Hurt Certificates should be issued in the usual manner:—

The Lords Commissioners of the Admiralty have directed that the following injuries should not be considered as being in the meaning of Article 1318 of the Regulations, and Hurt Certificates should not be issued in respect of them:—

Injuries sustained while at play in the Medical Officer's Quarters.

(N.O. 369/16.—Cancelled.)

(This Order will be reprinted for posting on Notice Boards.)

78.—Hospital Ships—Embarkation of Books and Ratings

(M. 31673/21.—19.1.1922.)

No ratings or other persons will be allowed to embark in Hospital Ships without the proper authority of the Medical Officer.

(A.F.O. 1172/21.—Cancelled.)

80.—Infectious Cases—Landing at Gibraltar

(M. 5030.—19.1.1922.)

No case of suspected case of cholera, plague or yellow fever can be landed at Gibraltar. If a case of suspected case occurs on board any of H.M. Ships the ship will have to proceed elsewhere to land it.

416.—Unemployed Pay—Position of Officers who fall Sick—Report

(C.W. 20984/21.—17.1.1922.)

I.—Officers on Unemployed Time.—Report Sickness.

Officers who fall sick while on unemployed time are to report the fact to the nearest Secretary of the Admiralty inspection of naval hospital. The distinction between sick of a grave nature in the Hospital Instructions (Regulations) and Naval Hospital Act 513 (R. and A.). Application for admission to a Naval Hospital should not be made by the officer reporting the illness, but should form the subject of a separate report to the Secretary of the Admiralty.

(2) Individual Officers who are detached illness from causes beyond their own control, the unemployed pay will remain unimpaired, provided they were available for duty at the time of the illness, but if they are not available for duty, the unemployed pay will be forfeited.

***659.—Officers on the Staffs of the R.N. Hospitals and other Medical Establishments—Victualling Arrangements**

(C.W. 8117/22.—10.8.1922.)

The following revised arrangements for the victualling of Officers on the staffs of the R.N. Hospitals and other Medical Establishments have been approved with effect as from April 1

[illegible] TALE. Has [illegible]

Rail [illegible]

[illegible] to [illegible]

Trap [illegible] led at the [illegible]

Rich at Mendle

[illegible] including the [illegible] the most but [illegible]

[illegible] be paid instead [illegible]

Provisions	[illegible]
Fuel	[illegible]
Light	[illegible]
Servants	[illegible]
Furniture etc. [illegible]	[illegible]

(2) In smaller [illegible] form a [illegible] not [illegible] arrangements [illegible] the large [illegible]

Notices

[illegible] Medical Officers to [illegible] personal experience [illegible] Naval Medical S[illegible] [illegible]

[illegible] to the Royal Naval Medical Department [illegible] London

The [illegible] Naval Medical [illegible] quarterly [illegible] value

The [illegible] Cox [illegible] to the Medical [illegible] THE ROYAL [illegible] Medical [illegible] Admiralty London [illegible] relating to [illegible] should be [illegible]

All Applications [illegible] to be addressed —
[illegible] ALLAMAIR [illegible] STREET LONDON W.C.

VOLUME VIII JULY 1932 NO. 3

Journal
of the
Royal Naval Medical Service.

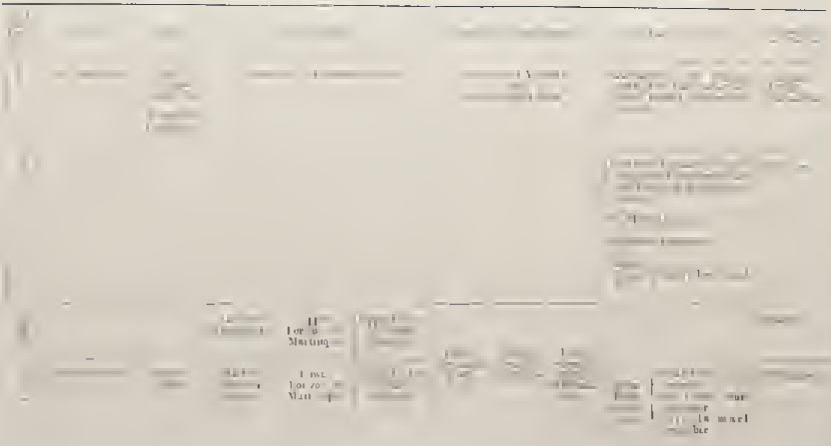
Original Articles.

NOTES ON RECENT STUDIES OF AMERICAN CORAL REEFS AND THEIR BEARING ON THE THEORIES OF CORAL REEF FORMATION

By Surgeon Commander J. A. Forrest, M.B., R.N.

During the past fifteen to twenty years the various problems connected with the archæology, biology and geology of both Central and South America have come to be regarded as within the special province of American scientists. Towards the equipment of the necessary expeditions the latter are fortunate in having funds made available by annual grants from the Smithsonian Institute, the Carnegie Institute and other scientific bodies, and it has thus been possible to effect a gradual extension of the field of research. In Central America geological studies have been facilitated by the exceptional opportunity which the construction of the Panama Canal afforded for a detailed survey of that section of the Isthmus. The data thus obtained provide a valuable means of correlating the geological formations of this region with those of the S.E. United States (Florida) and with those islands which form the eastern barrier of the Caribbean Sea. The geology of these widely separated areas presents a Tertiary facies with a palæontology remarkable for its wealth of fossil coral fauna. Moreover, recent investigations prove the important role of these fossil corals in assigning a correct geological horizon to the land masses of the Caribbean Sea, viz. both Greater and Lesser Antilles.

Towards a further elucidation of this and other problems during 1931 and the following years a party of American scientists under the direction of Dr. Wayland Vaughan were engaged in a study of the stratigraphical geology in a number of the Leeward and Virgin Islands.



[illegible]	[illegible]	Anguilla formation (Anguilla) beds at many localities in Cuba						Tampa formation	Aquitanian Chattian	
[illegible]	Upper Cubitas Lower Cubitas [illegible]	Corsi reef at Guasimas (Cuba)	Antigua formation (Antigua)	Pegram formation (Porto Rico)	Lower Oligocene Santo Domingo	San Rafael formation	Chattahoochee formation		Rupelian	
	Montpelier white limestone					Deposits with Posten all P. Beukeni and large discoid orbitoids	Vicksburg group	Byram calcareous marl; Marianna limestone; Red Bluff clay	Latterfian (Sannoisian)	
	Cambridge formation; Richmond formation	St. Bartholomew limestone (St. Bartz.) Widely distributed in Cuba and Haiti				Brito formation of Nicaragua	Jackson formation	Ocala limestone	Ludian (Priabonian) Bartonian	
						Near the Texas border: Claiborne group	Gisi bayou group	Cockfield sand; Cockfield formation; Pallahatchie bed rock	Auversian Lutetian	
						Near the Texas border: Wilcox formation	Wilcox group	Hatchatigbee formation; Bashi formation; Tuscahoma formation; Nanafalia formation	Ypresian Sparnacian	
						Near the Texas border: Midway formation	Midway group	Naheola formation; Shearsaches clay; Clayton limestone	Thanetian Montian	

[illegible] indicates [illegible] fossil forms

Palæontological collections were made, special attention being paid to a comprehensive and exact account of the successive coral faunas antecedent to the living fauna It was thus hoped that it would be possible to trace the development of the coral fauna through Tertiary time up to and including that of the Recent period

Physiographical studies were also carried out and were directed towards obtaining a basis from which deductions could be made as to the manner in which conditions became established that would be favourable to the growth and formation of the present day living coral reefs

Further investigations included special observations in the reef lagoons of the Bahamas and Florida, which have an important bearing on several of the coral reef hypothesis

The scientific results of these expeditions have been embodied in a number of reports which are distributed among the publications and proceedings of the several institutes and learned societies in the United States It follows therefore that unless access can be obtained to a library which includes this very extensive literature, difficulty will be experienced in following up data pertaining to the special sections into which the studies have been apportioned

For this reason the student interested in coral reef problems will greatly appreciate the sectional work dealing with that subject which is contained in *Bulletin* No 103 of the United States National Museum In that publication which is issued by the Smithsonian Institute Dr Vaughan has given a detailed account both of the coral fauna and of the physiographical data relating to the various West Indian Islands The article further includes a summary of the results of recent studies on American coral reefs as well as an able statement of the bearing of these observations on the most notable of the coral reef hypotheses

The following account therefore can lay claim to little beyond an attempt to outline Dr Vaughan's work, but as the subject of coral-reef theories has a strong interest for most naval men it is hoped that these notes may suggest a further study of the various problems that are involved Members of the Service in the past have made highly important contributions to coral reef research and it is particularly to those who may be stationed in tropical waters within the eastern hemisphere that the writer would commend an investigation along lines which are indicated below

GENERAL

Limestones are initially formed by one of two processes —

(1) Through chemical precipitation either by inorganic or organic agencies that lead to supersaturation of water with reference to calcium carbonate ($CaCo_3$)

(2) Through the activity of organisms that cause precipitation of calcium carbonate in contact with their tissue

Corals belong to the latter group, viz., those which secrete calcium carbonate. Here it is necessary to emphasize the geological importance of determining the source of the ingredients which go to make up the limestone. Thus great confusion has been caused in the use of the term "coral rock"; this has been equally applied to the Molluscan shell sand of the Bermudas, to the chemically precipitated calcium carbonate of the Oolites of the Bahamas and Florida as well as to the limestones composed of the remains of Foraminifera and Bryozoa. Similarly the terms, Coral Sand, and Coral Mud have been used in referring to bottom deposits in which there is no coral.

DEFINITION OF A CORAL BELT

A ridge or mound of limestone the upper surface of which has or lay at the time of its formation near the level of the sea, and which is predominantly composed of calcium carbonate secreted by organisms of which the most important are corals.

ECOLOGY OF CORAL REEFS

The conditions necessary for vigorous coral reef development are:

(1) Depth of water: maximum about 40 fathoms.

(2) Bottom firm or rocky, without silty deposits.

(3) Water circulating, at times deeply agitated.

(4) An abundant supply of animal plankton.

(5) Strong light.

(6) Temperature: annual minimum not below 18° C.

(7) Salinity: 27 to 38 parts per thousand.

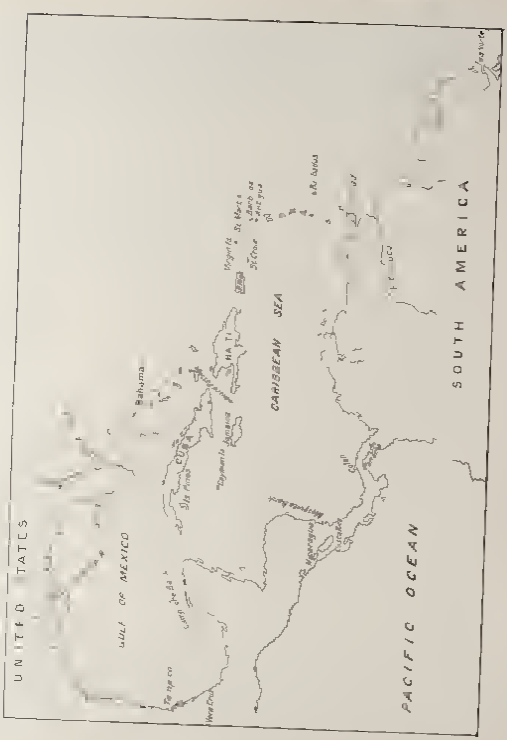
Table of reef coral development during Tertiary time and the geographical distribution of the relative coral faunas in Central America and the West Indies.—

In the accompanying table the marine sedimentary formations at Panama are correlated with those in the West Indies, Central America, and the South Eastern United States.

An asterisk is shown against those formations which enclose a coral fauna, and the table thus affords an index of the periods of building activity. The data pertaining to the respective geological divisions of Tertiary time are summarized below:—

(a) UPPER EOCENE.—A period of weak reef coral development.—The fauna of this horizon is found in St. Barth Jomes, Jamaica, Cuba, Haiti, and on the Pacific slope of Nicaragua—the corresponding formations in Florida yield a marine fauna indicative of temperate climatic conditions.

(b) LOWER OLIGOCENE.—No coral fauna of lower Oligocene age is known either in the West Indies or in Central America. This fact is consistent with an extension to this part of the world of the imperfect climatic conditions and the prevalence of these conditions throughout the whole of this period.


UNITED STATES
GULF OF MEXICO
Bahama
CUBA
HAITI
CARIBBEAN SEA
SOUTH AMERICA
PACIFIC OCEAN

(c) Middle [illegible] development of American coral [illegible] the [illegible] and is found in Antigua Porto Rico (Tantanum) (Cooke) Bainbridge Georgia) Alabama Eastern Mexico San Domingo and extending across the Isthmus to Panama

(d) Upper Oligocene —A considerable development of reefs—the fauna is present in Anguilla (Leeward Islands) in several localities in Cuba and also in Florida (Tampa formation)

A distinct break occurs between the Oligocene fauna and that of the succeeding Miocene period

(e) Miocene Period —A weak development of reefs This period is characterized by the disappearance of many genera of corals and by the introduction of species which persist in the present day fauna The Bowden formation of Jamaica is represented in San Domingo Cuba, Costa Rica

A coral fauna indicative of a higher horizon is found in Florida and probably also along the Southern shore of the Caribbean Sea in Colombia

(f) Pliocene Period —A weak development of reef corals occurs in Florida and at Limon (Costa Rica), but no reef corals of this age have been found in the West Indies

(g) Pleistocene Period is marked by an extensive development of coral reefs in Central America the West Indies and in Florida

(h) Recent Period —Living reefs exist in the same areas in which there are Pleistocene reefs

From the above it follows that a connection existed between the Atlantic and Pacific Oceans during the following periods —

(a) Upper Eocene

(b) Middle and upper Oligocene and lower Miocene

(c) A narrow connection in late Miocene or in Pliocene time

THEORIES OF THE FORMATION OF CORAL REEFS

Three kinds of coral reefs are usually recognized —

(1) Fringing, or shore reefs which occur along the strand line

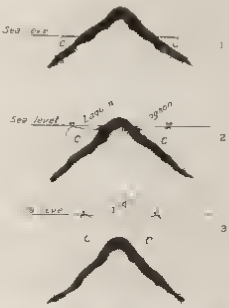
(2) Barrier reefs these occur at variable distances off shore and lay lagoons from 1 to 2 to as much as 30 to 40 fathoms in depth between them and the strand line

(3) Atolls which are ring like and enclose lagoons above whose surface no land masses of importance protrude

In the opinion of geologists the relations of "barrier reefs" and "atolls" to the platforms above which they rise constitute the essential part of the theory of the development of recent reefs For this reason a warfare has been waged over the interpretation of the conditions of a changing or changed position of the strand line, and over the part played by the reef forming organisms as constructional agents Thus the question

arises. Did the reefs grow up on pre-existent platforms, or are the platforms [illegible] building behind a reef during subsidence?

Darwin's theory is essentially bound up with the coral reef controversy [illegible] Forty years his explanation of coral-reef development was [illegible] all the requirements of physiographers. An outline [illegible] points of his hypothesis and is followed by an [illegible] of the [illegible] data on which the theories of subsequent [illegible] have been based.



[illegible]

[illegible] the production of an atoll. [illegible] Darwinian hypothesis [illegible] more than mere subsidence [illegible] reef. It then attempts to [illegible] platforms assuming that they have [illegible] on slopes [illegible] dependent on the [illegible] of.

[illegible] in the Pelew Islands advanced [illegible] solution of the [illegible]

[illegible] upwards [illegible] of reef [illegible] minute [illegible] to [illegible] by currents [illegible] — Barrier [illegible] have been [illegible] of volcanic [illegible] on a [illegible] rocks or [illegible] It is necessary to fill in submarine [illegible] any [illegible] features [illegible] reefs in [illegible] features [illegible] areas [illegible] variation of [illegible] submarine [illegible]

(4) *H B Guppy Steen* [illegible] 1880 [illegible] Australian Barrier reef [illegible] the [illegible] situated in the [illegible] was only [illegible] reefs to be [illegible] and multiplies growth If coral [illegible] the margin of the ledge where water [illegible] growth

(5) *Admiral Sir W J L Wharton* [illegible] 1887 [illegible] uniform depth of atoll lagoons whose [illegible] degrees by growing coral by minutiae [illegible] foundations that are bases of volcanic [illegible] wave action to wave base

This observation by Vaughan [illegible] contribution that has been made to [illegible] many areas Atolls he regarded as [illegible] limestone masses platforms of barrier [illegible] with [illegible] erosion without change of sea level

(7) *Jukes* [illegible] C in 1904 platform of Gt Barrier [illegible] submerged at a relatively recent date It continues [illegible] the reef and he inferred that only a minor part of the platform [illegible] of coral growth

(8) *Gardiner* J H in 1901 submarine plantations [illegible] depths [illegible] 200 fathoms

(9) *Halligan* and *Griffith Taylor* — Coral reefs [illegible] form that rise [illegible] show platforms [illegible] their slopes [illegible] winds and currents

Referring to the solution [illegible] distinctive [illegible] reef [illegible]

(10) *R A Daly* — [illegible] depths in the [illegible] reefs in barrier reefs [illegible] accordant He attributes the [illegible] subsequent to deglaciation whereby the depth of water [illegible]

[illegible]

(11) [illegible]

(12) [illegible] Summary [illegible] Investigations —

Evidence greatly multiplied in favour of recent submergence in coral reef areas

Living off shore reefs in those regions formed either during or after submergence and are growing on submerged basement platforms which conditions favour growth

Platforms are continuous beyond the limits of the reefs and their existence is in no wise dependent upon the presence of reefs

Whatever be the cause of shift in position of the strand line, off shore reefs form on shallow submarine flats during or after rise in sea level provided the rate of movement be not too rapid This explanation applies to the fossil reefs of Florida and the West Indies as well as to present day living reefs

In the Virgin and N Leeward Islands and off the shore of Central America there are submarine terrace flats—one at a depth of 17 to 20 fathoms and separated by an escarpment from a deeper flat at 28 to 30 fathoms These relations accord with the demands of the glacial control as expounded by R A Daly

(13) [illegible] Hypotheses—will comprise answers to the [illegible] questions —

(a) Important coral reefs of the world were they formed during or after [illegible] emergence of their basements?

(b) What is the rôle of corals as constructional agents? Is the flat [illegible] building behind the reef or was there a shallow marginal flat before [illegible] formed?

(c) Can a lagoon channel behind a barrier reef or the lagoon within an atoll be formed by submarine solution or by submarine scour?

(d) What effect have glaciation and deglaciation had on the development [illegible] reefs?

[illegible] deviation of the bearing of fossil and living reefs and the [illegible] these questions certain criteria are used

(1) *Criteria for Recognizing Shift of Position of Strand Line*

(a) Elevation of Strand Line —This is indicated by —

Coastal terraces bordered inland by escarpments and cliffs

Wave-cut grooves in cliffs and sea caves above the present strand line

The presence above sea level of fossil organisms that must have lived in the ocean

(b) Submergence of Former Strand Line —Indicated by —

Indentation of shore line and drowned valleys, in which in many

[illegible] channels are preserved [illegible] the surface of the sea [illegible] submarine flats below [illegible] relatively steep slopes and escarpments.

The presence in limestones below ocean level [illegible] and caverns that were formed by the solvent action [illegible]

The presence inland of free openings that [illegible] means of which ground water formerly flowed [illegible] peat bogs or swamp deposits composed of plants that [illegible] level.

Erosion unconformities at the bases of marine [illegible] subaerial erosion of the basement occurred [illegible] during which the formation accumulated in the sea.

(2) *Criteria for Ascertaining Relic of Corals as* [illegible]

(*a*) Where reefs are enclosed in formations that [illegible] that contain fossil corals the relative quantity of coral to other [illegible] can be readily estimated provided that there has not been a [illegible] of the limestone.

(*b*) Criteria applied in determining relations of the [illegible] which extends landwards from the barrier —

(i) If the flat is dependent on the presence of the reef [illegible] gaps occur in the barrier tongues of deep water [illegible] landward across the shallow flat behind the reef [illegible] should stand on the seaward edge of the flat [illegible] should not project beyond the sea surface of the [illegible]

(ii) If however it can be shown that the rock of the floor [illegible] the reef and that the floor has had a geological [illegible] cedent to the formation of the reef, it is demonstrable [illegible] reef is merely growing on the surface of a flat the [illegible] which is entirely independent of coral reef development.

(3) *Solubility of Calcium Carbonate in Sea Water by the* [illegible] *lection of Free Carbonic Acid*

A series of lengthy investigations carried out in the [illegible] shows that lagoons are to be regarded as areas of sedimentation [illegible] areas of removal of material. Thus it can be demonstrated that [illegible] by the action of denitrifying bacteria chemical precipitation [illegible] carbonate is taking place in the lagoons. Moreover, an examination [illegible] samples of water flowing into and out of these shallow [illegible] indicates an absence of free carbonic acid but a salinity higher than that [illegible] in the open sea which is thus evidence of concentration and not [illegible]

[illegible] *Record* [illegible] *Coral Reefs*

[illegible] *Different* [illegible] *Glaciation and Deglaciation on the Development of Coral Reefs*

[illegible] of the glacial [illegible] the following are necessary [illegible]

[illegible] geologically [illegible] emergence of most shore lines of [illegible]

[illegible] that the average amount of emergence equals the [illegible] sea level [illegible] during Pleistocene glaciation [illegible] of the shoal [illegible] Pleistocene glaciation should [illegible] reefs separating, first—their present position below sea [illegible] the amount by which ocean level has been raised [illegible]

[illegible] corals should be such that since the conti[illegible] coral reefs can have grown to a thickness [illegible] which sea level has been raised

[illegible] coral reefs and [illegible] should be superposed on ante[illegible] flats or platforms

[illegible] *Vertical Displacement of Sea Level due by Glaciation and Deglaciation*

[illegible] *Bays*.—Estimating the Pleistocene ice cap at 1 000 metres [illegible] Bay Greenland and Antarctica) and assuming the de[illegible] fifteenth the area of the ocean (or twice the [illegible] North America) has calculated the change in sea level to [illegible] feet

[illegible].—According to this authority at the time of maximum [illegible] seas occupied a level since 60 to 70 metres lower [illegible] present time. The maximum glaciation was probably of [illegible] greatest effect [illegible] would there [illegible] between 20 and 30 fathoms

[illegible] *Growth of Corals and Length of Post-glacial Time*

[illegible] of the last continental ice sheets is estimated to have [illegible] from 10 000 years ago in Scandinavia and Alaska [illegible] *Orbicella annularis* (the principal reef [illegible] Florida and the West Indies) has a growth rate [illegible] 0 mm per year and 150 ft in 7 300 years [illegible] development of any known living [illegible]

[illegible] Fossil Coral Reefs

[illegible] *Fossil Coral Reefs of the West Indies*

[illegible] table shows the stratigraphical relations of a number of [illegible] coral reefs

[illegible] indicate that the fossil reefs were formed during periods of

[illegible] above the base [illegible] of the formation [illegible] ments indicates shallow tropical water [illegible]

Age	Locality	[illegible]	[illegible]	[illegible]
Upper Oligocene	Canal zone (*Pelecypoda [illegible]*)	Lucoi[illegible] Cal[illegible] tion		
	Anguilla	Lucoi[illegible] igneon[illegible] on[illegible] conglomer[illegible]	[illegible]	[illegible]
Middle Oligocene	Antigua			
	Porto Rico (*Eq no formation*)			
	Cuba (Guantanamo			[illegible] wn
Upper Eocene	St Bartholomew		[illegible]	[illegible] erged

As the geological formations [illegible] ally [illegible] ntly formed on flats The corals begin [illegible] ecological conditions were favorable they [illegible] The formation of the flats can therefore [illegible] corals

Pleistocene Fossil Corals—During the [illegible] extensive growth of corals occurred in [illegible] enumerated above viz development took place [illegible] period of subsidence following an erosion of the base [illegible] the reefs formed In places however the elevation [illegible] this period [illegible] ue of the fringing type The latter present [illegible] at their base but it can be shown that usually it not [illegible] occurred During stages of uplift following on a considerable [illegible] of the land Oscillations of the earth's crust usually local [illegible] feature of the Pleistocene period

An illustration of the successive stages [illegible] accompanied by the formation of fringing reefs [illegible] slopes which border the Windward Passage at the [illegible] of

[illegible] ing will [illegible] cliffs formed at [illegible] stands of the land [illegible] coral reefs developed when conditions were favorable [illegible] During Recent time there has been submergence [illegible] flooding of the lower parts of the stream valleys [illegible] each

[illegible] of the South Eastern United States

[illegible] within the scope of the United States [illegible] and [illegible] conditions wells have been sunk in this region [illegible] former [illegible] be traced with a fair degree of accuracy

[illegible]	[illegible]	Distribution of reef corals and coral reefs	Changes in relation of base ment to sea level
[illegible]	[illegible]	Coral reefs	Submergence
[illegible]	Les Lap, [illegible] stor [illegible]	Coral reefs	Subsidence
[illegible]	[illegible]	No reefs a few corals	Subsidence
[illegible]	[illegible] Shoal River [illegible] Oak Grove sand	A few corals slight development of reefs in Central and Northern Peninsula Florida	Subsidence
[illegible]	Chipola marl	A few corals one species of reef fierce	Subsidence
[illegible]	Chattahoochee formation Upper	Coral reefs (Tampa [illegible])	Subsidence
[illegible]	Chattahoochee formation Lower	Coral reefs (Bainbridge)	Subsidence
[illegible]	Ocala limestone	No coral reefs	Subsidence
[illegible]	[illegible]	[illegible]	[illegible]

[illegible] table gives the stratigraphical distribution of coral reefs and [illegible] in the South Eastern United States and shows that with one [illegible] that of the recent period each development occurred [illegible] which followed subaerial erosion

[illegible] demonstrated that the Chattahoochee reef was superimposed [illegible] platform not produced by corals viz Ocala limestone [illegible] *of Corals* The surface formations over the greater [illegible] Peninsula were laid down during Pleistocene time [illegible] possible to apply plummeter measurements in [illegible] in which the limestone can be ascribed to coral growth

The measurements for this region indicate an [illegible] the Pleistocene coral reef, as against an area of [illegible] square miles for the chemically precipitated calcium carbonate of the Miami and Key West Oolites Dr Vaughan estimates that during Pleistocene time the chemically precipitated calcium carbonate predominated over that secreted by corals in the ratio of 100 to 1

Summary of Data on Fossil Reefs of South Eastern United States

(1) Corals have played a subordinate, and usually a negligible part in building the Floridian plateau

(2) Every conspicuous development of fossil coral reefs or reef corals took place during subsidence

(3) In every instance the coral reefs or reef corals have developed on platform basements which owe their origin to geological agencies other than those dependent on the presence of corals

BEARING OF EVIDENCE AFFORDED BY A STUDY OF LIVING CORAL REEFS IN THE WEST INDIES

Change in Position of Strand Line—Throughout the whole of this region and in both Central and South America it can be demonstrated that the last important movement of the strand line was one of submergence This is borne out by biological evidence pointing to land connection during Pleistocene time of the two present islands of the Antigua Barbuda bank and likewise of those islands that now rise above the St Martin's submarine plateau Similarly it can be shown that at that time Porto Rico was joined to the Virgin Islands and the Island of Pines with Cuba

Additional support to this view is afforded by indented shore lines and drowned valleys in Antigua by a bed of peat 4 ft thick which is found to be submerged to a depth of 20 ft and by characteristic pouched harbours where in cases former stream channels, now filled with silt can be traced under the sea surface, *e g* Havana

Amount of Submergence—The sea over the Antigua-Barbuda bank reaches a depth of 18 fathoms and a similar depth separates the individual islands of the Virgin bank as well as the latter from Porto Rico Submerged flats which abut on scarps at their landward margin can be traced on the Antigua Barbuda bank[1] and on the St Martin's plateau and point to a submergence of about 120 ft (see fig 2)

Soundings indicate a deeper flat off St Martin's plateau and off the Virgin bank With regard to the latter area the following terraces can be traced on the leeward side flat at from 6 to 10 fathoms ending in a steep slope above the intermediate terrace which ranges from 14 to 20

[1] For a demonstration of the submarine terraces the soundings should be studied on large scale charts of the Virgin Islands and Islands of the St Martin group

fathoms; this latter terminates in a ring above the deepest level, and with soundings of from 15 to 30 fathoms.

On the windward side the depths over the flats or terraces are respectively 7 to 10 fathoms, 14 to 20 fathoms, and 26 to 34 fathoms. It is significant that on the windward side the intermediate flat is absent, very pronounced tips whereas its outline is preserved everywhere on the leeward slopes to leeward.

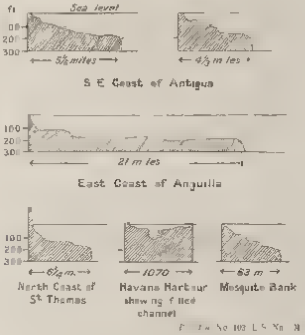


Fig. 2 No 102 U S Nav 38

Fig. 2.—Subsurface profile of West Indian Islands.

Other Data Indicative of Submergence.

[illegible] A submergence of at least 100 ft can be demonstrated [illegible] by Agassiz the living corals are growing on a foundation [illegible] Confirmation of the fact has since been obtained [illegible] operations which were undertaken at Gulbs Hill Basaltic [illegible] lie over 100 ft while the limestone deposited above that level is [illegible] non coraliferous throughout The marine organisms contained in the latter formation indicate shallow water deposits which successively go back to Eocene time

A summary of the geological history of Bermuda would therefore be —

(a) Shoal water deposits (shell sands) laid down on the summit area of a submarine volcano

(b) Slow subsidence of the land and consolidation of this shell sand into limestone rock

(*c*) Upl[illegible] Pleistocene time and the [illegible] Bermuda [illegible] even times more extensive [illegible] at pre[illegible] level

(*d*) [illegible] period during which stalactite caves were [illegible]

(*e*) Submergence during Recent time the land area been [illegible] reduced, while over extensive inundated flats conditions favourable [illegible] growth of coral-reefs became established

The most important evidence pointing to submergence is that afforded by the well known stalactite caves which have now been invaded by the sea. It should be noted that the stalagmites, or bases of the stalactite pillars within the caves are submerged where is their formation could only take place under fresh water conditions and where there was a possibility of free drainage to the ocean

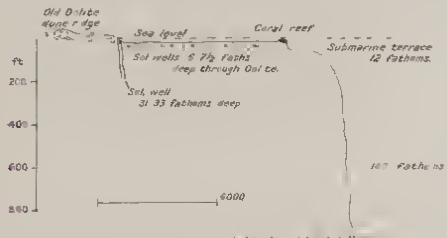


FIG 9.—Diagrammatic section across Barrier Reef Andros Isl[illegible] Bahamas

BAHAMAS.—The formation met with in the Bahamas is an Oolitic limestone of Pleistocene age, similar to that described in Florida viz it consists of chemically precipitated calcium carbonate which has been deposited on extensive shallow submarine flats In the diagram (fig 3) a barrier reef is shown on the edge of a platform that has stood at least 192 ft above sea level

Proof of this is afforded by the solution well which perforates the Oolite to a depth of 31 to 33 fathoms and which is now submerged This channel could only have been formed under conditions that permitted the escape of surface waters to the ocean viz during a period of lower stand of sea-level

JAMAICA AND CUBA.—Ponched harbours form a feature of the coast line of these two large Islands In Havana harbour (see fig 2) it is possible to demonstrate the presence of a stream channel which has been

[illegible] stone, but which following on a rise in sea [illegible] with silt the data point to a submergence of at [illegible]

[illegible] was that subsequent to the formation of the [illegible] there was an uplift of the land totalling [illegible] followed by submergence of at least 30 ft [illegible] rise in sea level is afforded by submerged [illegible] submerged [illegible] by solution wells, &c.

Living Corals to Basement—Everywhere the living reefs [illegible] growing on a platform which has been submerged during Recent [illegible] emphasized that the platforms existed prior to this [illegible] and that in places corals are now growing on what during [illegible] must have been dry land areas The width of a [illegible] fringing, a land area at the present time, therefore [illegible] is an index of the stage that planation processes had [illegible] submergence occurred

[illegible] rise of sea level subsequent to deglaciation brought about [illegible] favourable for coral formation over enormous areas and has doubtless been one of the important factors in causing the great development of coral reefs at the present time

The continuity of the platform irrespective of the presence of corals [illegible] clearly demonstrated—a striking illustration is afforded off the [illegible] coast of Florida where reef growth ceases at Fowie Rock whereas the [illegible] continued for a considerable distance northwards beyond that [illegible]

Littoral and Sublittoral Profiles and their Relation to Coral Reefs—[illegible] sublittoral profiles are met in the West Indies —

(a) Volcanic islands (a) of recent data, *e g*, Saba Island, into the [illegible] which the sea has cut scarcely any platform (b) older than the [illegible] *g* St Kitts where a narrow platform has been eroded

(b) Wide under sea flats where planation agencies have been at work [illegible] have an area many times that of their present land surfaces *e g*, [illegible] Florida St Martin's plateau, Virgin bank (see map, p 166)

(c) Uplift plane profiles

(d) Submarine banks *e g*, Saba bank where the upper surface is 9 to [illegible] below the sea level

A study of sublittoral profiles is of value in determining the positions [illegible] which coral reefs occur It can be shown that all of the above [illegible] have been subjected to recent submergence but in no instance can [illegible] demonstrated that a fringing reef has been started on a sloping base [illegible] grown seawards to form a barrier reef with resultant platform This no growth of coral is found on the fault scarp profiles on the north coast of St Croix, but a barrier reef has formed on the gently dipping submerged slope which extends south of that island

The submarine banks of the West Indies are of scientific importance in

that they essentially duplicate the great atoll of the Pacific—Saya Bank, with an extent of forty miles from east to west is to be regarded as a submarine plateau which has been levelled by planation agencies, both submarine and subaerial and which has been submerged in recent geological time. A meagre growth of coral occurs on the windward side of this plateau surface. In this instance therefore it can hardly be assumed, as is claimed in the case of large Pacific atolls, that the coral growth is in any way responsible for the level surface behind the reef.

Submerged Banks North of the Coral Reef Zone in the West Atlantic.—North of the temperate zone in which coral reefs now exist there are submarine banks at suitable depth below sea level for the growth of reef corals. These are the Georges Bank and the Grand Banks of Newfoundland. Their presence is entirely independent of corals, but, under the necessary ecological conditions corals would grow on the surface of such banks.

Role of Corals as Limestone forming Agents.—The oolitic deposits of the Bahamas are referred to above. Recent investigation shows the importance of bacteria in bringing about the deposition of calcium carbonate and it is found that both ordinary crystals of calcium carbonate and Oolites may be produced by the action of mixed cultures of bacteria either in salt or in fresh water. The zonal structure of the Oolites of bacterial origin and of those found in oölitic deposits appear to be exactly the same. From a lengthy series of observations in the shoal waters of South Florida and the Bahamas, Dr. Vaughan found bacteria to be the most important agency whereby calcium carbonate is taken from the sea water. The other agencies, rated according to importance are probably (1) Foraminifera, (2) Mollusks, (3) Corals, (4) Coralline alga.

Coral Reefs of the Pacific Ocean.—Similar conditions to those of American reefs apply to the Great Barrier Reef of Australia. Thus the platform has an existence independent of the reef and where the conditions favourable to their life are realized corals have established themselves on this shelf. The platform continues southward beyond the coral reef limits in many places it can be shown that the barrier reef stands not on the margin of this shelf but miles landward from its edge. There is evidence of a submarine terrace at rather more than 120 feet and there are indications also pointing to the existence of a former shore line at 25 to 30 fathoms below present sea level.

ATOLLS.—Two kinds are distinguished.

(1) Those rising above relatively shoal water platforms, *e.g.* atolls of Great Barrier Reef and the Floridian Reef Tract and which have been shaped by the prevailing currents (mostly wind induced).

(2) Those that more or less completely encircle the flat summits of eminences that rise from ocean depths.

As pointed out by Admiral Wharton, the flat floor is an invariable characteristic of large atolls[1] whether the rim be above or below the

[1] See large scale Admiralty Charts *e.g.* of Funafuti atoll.

surface According to Darwin's hypothesis the lagoon floor should be bowl shaped (fig 1) Submarine solution at great depths must be regarded as chemically impossible The probable explanation therefore is in favour of the view that the foundation of a large atoll is a submerged plateau surface upon which marginal coral reefs have established themselves and that the flat summit areas have resulted from processes of subaerial erosion and submarine planation during pre-Pleistocene time The soundings over a number of submarine banks *e g*, Saba Bank indicate that these were in large part above water in Pleistocene time Because of deglaciation they have undergone moderate submergence, when the conditions favourable to coral growth would exist The greater luxuriance of reef-forming organisms on the periphery of atolls is due mostly to the intolerance of such organisms to sediment A matter for further detailed study refers to the existence or otherwise of wave-cut benches at stated depths round atoll banks—if discovered they would afford additional and most important confirmatory evidence of the deglaciation theory

CONCLUSIONS

The following results are claimed by Dr Vaughan from the examination of the tertiary pleistocene and living coral reefs and reef corals of the West Indies, Central America, and the South Eastern United States

(1) The fringing reefs have formed usually if not invariably, during periods of intermittent uplift following considerable submergence

(2) All of the important off shore reefs, fossil and living, developed during or following submergence after the subaerial erosion of their basements

(3) Most of the fossil off shore reefs, all of those on which information has been obtained and all living off shore reefs are superposed on antecedent flattish basements or platforms Where there are no platforms, as off fault shore lines and young volcanic islands there are no off-shore reefs.

(4) Although corals are constructional geological agents they are subordinate to other limestone forming agencies, and none of the American platforms was formed by infilling behind a barrier

(5) Submarine flats and plateaus at proper depths below sea level to have furnished basements for off shore reefs are not confined to the temperate zone Thus Georges Bank, Nova Scotia, and the Grand Banks would be suitable for reef coral growth if other ecological conditions were present

(6) The submergences during and after which fossil reefs were formed, were almost certainly due to differential crustal movement The submergence of living reefs was probably due to complex causes

Differential crustal movements occurred during pleistocene time and at some places during Recent time In addition there seems to have been general submergence of the East Coast of America during Recent time from

the Argentine to New England. The amount lies between 10 and slightly more than 20 fathoms—an amount that would be expected from the effect of deglaciation in raising sea level. The principal wave formed Pleistocene plain now lies at a depth of 26 to 36 fathoms, and is separated by an escarpment from a shallower plain now ranging at between 17 to 20 fathoms. Indications off St. Thomas, St. Martin's and in the Bahamas, suggest that there was a short stand of sea level at about 40 fathoms below its present stand (see figs. 2 and 3).

(7) The fact that the terrace between 17 to 20 fathoms is cut away on promontory tips on the windward side of St. Thomas while preserved in protected areas indicates that the higher flat is older than the lower, and that it has been resubmerged after the development of the lower flat. The similarity of submarine profiles off Antigua, St. Martin's, and on the Mosquito Bank justifies inference of similar lowering and subsequent rise of sea level in these areas.[1] Fall of sea-level during Pleistocene time and a rise during recent time is indicated for the Bermudas, Bahamas, Florida, Central America and the mouth of the Amazon. Those phenomena are in accordance with the demands of the glacial control hypothesis.

(8) The principal living West Indian and Central American reefs are superposed on submarine flats or plateaux of pre-Pleistocene age that were dry land areas during at least a part of Pleistocene time and, while they were dry land, they were wave-cut and remodelled around their margins by submarine planation.

(9) Two kinds of atolls are distinguishable:—

(*a*) Those that rise above relatively shoal water platforms, and are shaped by the prevalent currents, which are largely wind induced.

(*b*) Those that more or less completely encircle the flat summits of eminences that rise from the ocean depths. These rings are formed by constructional geological agencies because as submarine solution in such areas and at such depths is chemically impossible a lower flat area surrounded by a higher rim cannot be formed by submarine solution or by any known destructional agencies. The depths over a number of banks *e.g.*, Saba Bank indicate that they were, in large part, at least above water during Pleistocene time, and that the flat summits are largely due to processes operative in pre-Pleistocene time. A levelling of the summit areas should, therefore, be attributed to the forces of subaerial erosion and of submarine planation.

The living coral rims on the banks have formed subsequent to Recent submergence.

Two factors determine vigorous development of off-shore reefs, which, under the most favourable conditions, form barriers or atoll rims, the other ecological conditions being present:—

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[1] See fig. 2.

[illegible] flat which [illegible] side [illegible] the [illegible] which [illegible] [illegible]

Gradual submergence The gradual submergence of the offshore flat [illegible] tutes the favourable conditions for the life of reef building corals [illegible] gives opportunity for continual growth upward

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THE NAVAL NURSING SERVICE[1]

By Miss MILDRED E HUGHES R.R.C. Head Sister Q.A.R.N.N.S.
R.N. Hospital Plymouth

THE development of Sick Nursing which has brought into existence a large highly skilled and organized profession is one of the most notable features of modern social life The evolution of the Sick Nurse is mainly due to three very diverse influences—religion, war and science

It was religion which first induced ladies in the earlier centuries of Christianity to take up the care of the sick as a charitable duty The oldest forerunner of the great Sisterhood of Nurses was Fabiola, a Patrician Roman lady who in A.D. 380 founded a hospital in Rome and devoted herself and her fortune to the care of the sick poor She had a rival in the Empress Placcilla the pious Consort of Theodosius I who about that time also personally visited the hospitals and attended to the sick

Organized nursing does not appear to have formed any part of medical treatment except in so far as the Deacons of the Church attended on the poor until the 4th century of the Christian era After that date the employment of women for this purpose must have developed rapidly, for in the reign of Honorius (A.D. 395—423) 600 women were engaged in the hospitals of Alexandria

These institutions were managed by the clergy, and throughout the other and middle ages hospital and nursing systems were connected with religious bodies Nurses were provided by the male and female monastic orders an arrangement which still continues in Roman Catholic countries although it is gradually being supplemented by trained nurses through the increasing demand of medical science which has led hospitals to establish training schools of their own The names of the oldest foundations which still survive such as Hotel Dieu in Paris, St Thomas's and St Bartholomew's Hospitals in London, the Order of St Augustine

[1] A paper read at the R.N. Hospital Plymouth on March 8 1922 before the Commander in Chief and Lady Browning and several Officers of the Fleet and their wives

[illegible] modern [illegible] of Jerusalem [illegible] the original [illegible]

The [illegible] of St Vincent de Paul [illegible] largest [illegible] organization in the world

In Protestant England, where [illegible] have reached their highest development, the [illegible] alike prized by its holders and honoured by the [illegible] popular and professional synonym for head nurse and [illegible] association

Nursing as a popular and fashionable [illegible] a modern invention In Protestant countries [illegible] came in with the Reformation The staff [illegible] Bartholomew's Hospital on its re-establishment by Henry VIII [illegible] consisted of a matron and twelve nurses who were [illegible] occupations when off duty Thus nursing became [illegible] an inferior means of livelihood adopted by women of [illegible] without any training or special skill, and so it continued [illegible] the 19th Century when a new movement began which [illegible] the status of the nurse

The distinctive feature of this movement was the [illegible] training of nurses for their vocation Previously a [illegible] of regular instruction had no doubt been given here and there [illegible] physicians and surgeons Lectures to nurses were [illegible] New York in 1790 but these were isolated efforts Such skill as [illegible] was picked up in the wards no publications were [illegible] and they have been forthcoming so long had the [illegible] in public estimation

The credit of inaugurating the new order of [illegible] Community and here again the religious influence came into play

The beginning of the modern system dated from the foundation of an institute for training deaconesses at Kaiserworth by Pastor Fliedner in 1836 It is true that State Training Schools for male nurses had previously existed in Prussia the oldest having been founded in 1790 but the employment of men in hospital wards is a feature of the German system which has not been copied by other advanced countries (except in the case of the three services Navy, Army and Air Force) and it seems to be in process of abandonment in Germany

It is a heritage from the middle ages, when knight hospitallers undertook for men the duties discharged in female institutions by the nuns The male schools, therefore, stand somewhat apart though they mark a stage in the evolution of nursing as the earliest regular training establishments

The Kaiserworth Institute, on the contrary had far reaching and lasting influence and may fairly claim to be the mother of the modern system

England in particular owes much to it, for there Florence Nightingale

required [illegible] ledge which enabled her afterwards [illegible] remarkable [illegible] tion to such brilliant account

The [illegible] Kaiserswerth was soon followed and [illegible] Germany [illegible] Society of Friends founded a [illegible] and in 1840 Mrs Fry a member [illegible] community started the Institution of Nursing in London In 18[illegible] the nurses attached to it numbered ninety They received then practical training at St Thomas's and Guy's Hospitals The training system thus inaugurated on a semi-religious basis received new impetus by the second influence—War first the Crimean War then the Civil War in America and the subsequent great conflicts on the Continent

From the earliest days the suffering caused by war has brought forth the noblest characteristics of women Patrician ladies accompanied their lords to the scene of battle chiefly to tend and care for them should they be sick or wounded and they became highly skilled in the preparation of herbs and in the dressing of wounds this knowledge was considered most important and was passed on in great families from one generation to another, and further instruction was often received in the convents For centuries this was done but it is not until the year 1854 that we hear of the greatest of all nurses who tended the sick and wounded

In that year England was stirred to its depths by the reports of the sufferings of our soldiers in the Crimea there was an utter absence of the commonest preparations to carry out the first and simplest demands in a place set apart to receive the sick and wounded of a large army

The condition of the large barrack hospital at Scutari was deplorable Thanks to the publicity given to this state of affairs in *The Times* a new departure was formed which riveted the eyes of the civilized world

A Royal Commission of inquiry was appointed and a patriotic fund opened money flowed in and Miss Florence Nightingale was asked by the Secretary of War to go out to the Crimea To her this was the trumpet call of duty On October 24 she set out with thirty-seven nurses, some volunteers, some professionals trained in hospitals The story of the labours of this little band at Scutari is one of the brightest pages in English annals

Miss Nightingale soon had 10 000 men under her charge and the general superintendence of all the hospitals on the Bosphorus The work undertaken and accomplished by this lady was far more important than the mere nursing of sick and wounded soldiers she had grasped principles of hygiene which were then beginning to be understood, and she applied them to the reform of hospital administration

Gradually the effect of the measures adopted were seen in the lowered death rate in February, 1855, it was as high as 42 per cent, before many months it had sunk to 2 per cent

In civil life Miss Nightingale's example and work had a marked effect in stimulating the training movement, in raising the status of the nurse,

[illegible] large number it w[illegible] to take up [illegible]

[illegible] particular [illegible] minus [illegible] of the [illegible] about [illegible] and [illegible] up a [illegible] for [illegible] on the working [illegible] Medical [illegible]

In 1860 the modern hospital school system was definitely inaugurated by the opening of the Nightingale Fund School at St Thomas's Hospital founded by the £50 000 subscribed by the British public in recognition of Miss Nightingale's national services it was worked on principles laid down by her

It remained for the third influence Science, to complete the work begun and to develop systematic nursing to its present dimensions

Since 1880 the increasing demands of medical knowledge have well nigh revolutionized the profession in the home and the hospital The outcome has been to further raise the dignity of the calling and to induce women of the higher classes to adopt it in increasing numbers to enlarge the demand for their services and to multiply the means of training them

Exactly thirty years after the first Army Sisters went out to the Crimea—in October, 1884, the Naval Nursing Service was instituted as it was considered by those in authority that some action must be taken to improve the nursing in Naval Hospitals

Such radical changes have taken place during the thirty seven years which have elapsed since then that it may prove of interest to some to sketch briefly the birth of this Service and its growth during that time

For the first 100 years the nursing at the Royal Naval Hospitals of Haslar and Plymouth was done by untrained women but men labourers were employed to wash the patients and to keep them clean

From the annals of the hospitals these women seem to have left much to be desired both socially and morally We read of one Miss Elias Smith in March, 1719 being caught stealing a silk handkerchief a pair of silver buckles and 3s 6d from a seaman patient It was also strongly suspected that they connived at the frequent desertions of the men from the wards, being bribed with the wines and stimulants ordered for the patients

On the other hand these women were very badly paid for the first few years they received only 2s 6d weekly but this was increased later to £12 per annum We find too that when these nurses were discharged they complained that they could not get their wages from the Steward's Office without paying a premium

We also read of nurses being beaten by patients one at any rate being so badly treated that her life was endangered

In 1851 these women were replaced with one or two exceptions by men, who were almost entirely old pensioners and were engaged and discharged locally as the number of patients in hospital fluctuated, they were quite distinct from the nursing staff afloat

The [illegible] on nursing to say the [illegible] was done by the patient [illegible] fractured legs [illegible] injuries being made to turn out and [illegible] of the work.

Early in 1881 the whole question of the nursing in Naval Hospitals was referred to a Committee presided over by Admiral Hoskins. This Committee recommended the introduction of a small staff of trained lady nurses, also a Sick Berth Service which would combine the duties of nurses both afloat and ashore, that they should do the nursing in ships and hospitals, and look after the wards of the Naval Hospitals.

The first information received at Plymouth of any intended change in the nursing arrangements was an Admiralty letter on March 20, 1884, stating that in view of contemplated changes in the Nursing Staff, care was to be taken not to purchase more nurses' clothing than was absolutely necessary for immediate wants.

This was followed on May 9 by a letter to the Inspector General (Dr John MacLean) telling him to report when a certain house lately vacated by a Surgeon Wilson would be ready for occupation by Mr Ewing, Dispenser in Charge, so that immediate steps could be taken to prepare the house at present occupied by Mr Ewing, and also the Old Chapel, for the female Staff of Nurses.

On June 13 a peremptory letter was received from the Director General (Dr John Reid) requesting to be informed why it had not been carried into effect within a month after his first letter, that Mr Ewing had [illegible] the quarters in Chapel Buildings (present Trafalgar block) at all but two empty wards instead, adding that the delay had caused the loss of much valuable time.

There is no record of the Inspector General's reply.

Early in October, 1884, six sisters were appointed to Haslar and a head sister and four nursing sisters to Plymouth. On arrival they were made to feel and given to understand that their advent was anything but popular, as many of the medical officers were concerned, and naturally their views of the civil male nurses on the subject were even more pronounced.

The sisters before going on duty were given a blue book to read, in which they were given the opinions of a large number of medical officers [illegible] and practically all were antagonistic.

But [illegible] a copy of the original regulations for sisters cannot be [illegible] but in them they were told not to do anything with their hands [illegible] only to direct the nurses in their work.

[illegible] soon found to be impossible as there was so much to be [illegible] which were addressed by both nurses and patients as Mr [illegible] one having as many as six wards [illegible] in charge two enteric wards under her care.

In these early days the medical officers were not supposed to speak to

the sisters on duty this may be the [illegible] [illegible] [illegible]

through the [illegible] as a dec[illegible] with reference to Art. 12[illegible] Instructions Mi[illegible] ld not wear the [illegible] as shall further instructions wer[illegible] ed from their lordships.

The Chief Surgeon in charge of the surgical side was evidently not so whole heartedly in favour of nursing sisters. In his report, after pointing out certain cases which could not be under the sisters' care, he went on to say: "It is necessary to eliminate from the surgical wards all affections involving the middle third of the body which causes some inconvenience and leaves but few duties to be performed by the sisters in question." He continues: "I must however speak in the highest terms of their abilities in such matters as the application of dressings and bandages and they are of great assistance in supervising the linen, ensuring the cleanliness of the bed patients and in patients and in the administration of medicines."

During this time the number of sisters gradually increased, and in the [illegible] of a few years others were appointed to the smaller Naval Hospitals and to Malta and Gibraltar, and in 1904 three were sent out to Hong-Kong.

In the year 1903, when the new Selborne scheme for the entry and [illegible] of naval cadets resulted in the opening of the Royal Naval [illegible] at Osborne and Dartmouth, nursing sisters were appointed to [illegible] colleges to do the actual nursing duties, as it was considered this would be the most satisfactory arrangement for the care of these boys [illegible] on the sick list, though previous to this sisters had been in charge of the sick quarters at Dartmouth during the days of the *Britannia*.

The dresses first decided on for the sisters were grey like the Army sisters' but with navy blue capes instead of the military scarlet, but a few months later this decision was altered in favour of navy blue serge dresses with capes to match, and a Geneva cross was worn above the elbow on the left sleeve.

Years later, in 1912, a further change was made, the serge dresses being replaced by blue washing ones, and the small laced trimmed cap with strings tied under the chin, by the handkerchief cap now worn. The original pattern of cloak was also improved upon.

During the war, when the wearing of outdoor uniform was compulsory thanks to the kindly consideration of the then Medical Director General the inconvenient and unbecoming cloaks and bonnets were replaced by navy blue coats and hats.

In 1902 Her Majesty Queen Alexandra intimated it was her gracious pleasure to assume the Presidency of the Staff of Sisters in Naval Hospitals, consequently from that date the Service has been designated as Queen Alexandra's Royal Naval Nursing Service (Q.A.R.N.N.S.) and the Geneva Cross on the sleeve was replaced by an embroidered badge consisting of a Red Cross on a white ground in a gold border, and above Her Majesty's

monogram, viz, two A s in red interlacing an anchor and cable in gold the whole surmounted by the Imperial Crown this was worn on the cape as it is in the present day

Until the last two or three years Her Majesty Queen Alexandra personally signed the paper confirming each sister found suitable for appointment in the Naval Nursing Service

Of late years the Service has consisted of some sixty members who on appointment, must prove to be of British parentage or naturalized British subjects and, besides fulfilling certain conditions, must possess certificates of training for at least three years at a large civil hospital in the United Kingdom

They serve on probation for the first six months then, if found suitable are confirmed in their appointments Their duties are confined to the hospital to which they are attached, they are responsible for the nursing and care of the patients and are assisted in their duties by the Sick Berth staff they also give practical instruction to the junior members of the staff on duty in their wards

Their appointments in the hospitals abroad are for three years but at home are for varying periods

There are three Head Sisters one at Haslar Chatham and Plymouth they exercise general control and supervision over the nursing sisters and distribute them for duty in the different wards The Head Sister is also president of the mess, and is in charge of the maids and of the domestic arrangements in the sisters quarters

In 1911 the new rank of Superintending Sister was instituted Seven nursing sisters were selected and promoted and appointed to Haslar, Plymouth Chatham Portland and the three foreign hospitals

These sisters in the large hospitals assist the Head Sister generally, and are in charge of the senior officers block In the smaller ones they perform the duties of a senior sister

In October 1910 the Naval Nursing Service Reserve was formed as it was considered necessary to be able to provide additional trained nurses at short notice in the event of war on a large scale

Arrangements were accordingly made with the authorities of the principal civil hospitals in the country by which the required number of nurses could be called up when necessary

When war was declared in August 1914 a large number of trained nurses joined for service at Haslar Plymouth and Chatham during the first week according to arrangements made in 1910 and in a short time others were sent to the smaller hospitals thus freeing sisters of the Permanent Service for hospital ships and Sick Berth staff for wherever necessary

During that first week eight nursing sisters from Haslar, and four from Plymouth and Chatham were at once appointed to hospital ships, and different numbers served afloat continuously until early in 1920 Then

duties were similar to those in hospital, and they were again assisted by the Sick Berth staff.

There were few outstanding events affecting the Naval Nursing Service during those years of war, but much excellent work was done by the permanent sisters and some 200 reserve sisters at home and abroad and in hospital ships, without any of the excitement of that of the Sister Service in France and Flanders, but those members who served afloat shared the risks of the men, and those stationed in hospitals on the East Coast had often to carry on their strenuous work under most difficult conditions on account of air raids.

Four sisters were on board the hospital ship *Rohilla* when she was wrecked in 1915; four were also in the *Rewa* when she was torpedoed and sunk in 1917, and three from the hospital ship *Drina* lost their lives in the *Natal* calamity in 1916, the sole survivor owing her life to losing the toss as to whom should stay on duty.

Although their nine sisters lost their lives in the war.

After the armistice the hospital ships *Garth Castle* and *Berbice*, in which sisters were serving, were sent to the Baltic ports to repatriate sick prisoners of war from East Prussian camps; they were taken to Copenhagen and then transhipped to their own countries.

The *Berbice* made several of these trips, and was then sent to Scapa to take in and nurse the sick from the German surrendered fleet in the North Sea. After these ships were sunk, the *Berbice* was sent up the Baltic to take the sick from Admiral Cowan's Fleet lying round Cronstadt. She returned in February 1920; since then no sisters have served afloat.

The last of the Reserve Sisters were demobilized some months ago, and to-day this Service, of which so little is known in the outside world, is carrying on in its usual unostentatious way as it did before the war.

As a further outcome of the war massage sisters and trained masseuses have been temporarily added to the Naval Service, while the shortage of sick nursing staff has been made good from time to time by V.A.Ds. These services were most valuable.

A [illegible] CONSIDERATION OF THE [illegible] OF A [illegible] KNOWLEDGE OF THE [illegible] MENTAL [illegible] IN HIGHER GUNNERY [illegible] AND WITH SPECIAL REFERENCE TO [illegible] TIME AND PERCEPTION [illegible]

By Surgeon Commander W K D [illegible]

[illegible]

[illegible] Medical Correspondent of [illegible] Nature [illegible] 1922

In the primary object of this article is an endeavour [illegible] the space at my disposal the [illegible] the [illegible] assistance of ability in the selection of the [illegible] [illegible] and ability and [illegible] the [illegible] more [illegible]

Times [illegible] and the standards [illegible] are just [illegible] in the light of to day It is [illegible] the [illegible] of the [illegible] in match box maker and [illegible] work of the Industrial Fatigue Research Board of 1920 and onwards Real enthusiasm, perhaps, came with the classic experiment of Mather and Platt in 1893 when it was demonstrated after several years of experiment that [illegible] hours worked from fifty four to forty-eight resulted in increased production and a decrease in lost time And in the years that have followed can be seen an ever growing appreciation of the human element is the prime factor in every industrial enterprise—in every kind of labour Dusty corners may remain for man but their time is short

Taylor's Motion Studies and Routh Systems much exploited in America and more recently in this country, take a big stride in the path way of progress both in the elimination of each unnecessary movement and in a refinement of team work that enhances the curve of output and retards fatigue and the toll of hours worked Vocational selection and guidance suitability adaptability and fatigue are the nucleus of many problems that are slowly being flogged out in the industrial world

Of fatigue in particular I shall say a little later on in this paper it is rather with the more elementary mental assets that I wish to deal here though they form but links in the chain that define the human machine and its limitations

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From the early dawn of animal life organisms have had to react to the particular environment in which circumstances have placed them and in

[1] First and second Annual Reports of the Industrial Fatigue Research Board, the former to March 31 1920 and the latter to September 30 1921 Published by H M Stationery Office

its turn the environment may be said to react on the organism. Everything that has life has some equipment that is ultimately definable as defensive and in that defensive we can include *inter alia* mimicry, avoidance of consequence and even the offensive the objective is always the same the preservation of the individual or of the community of which he is a unit

The simplest forms of animal life have some "answer back," some "reflex action" to that which is dangerous or distasteful to them in their surroundings and in the efficiency of that "answer back" lies the primitive equipment of self defence Hardly dare we say for instance, that the recoil of a snail into its shell, or the curling up of the tiny woodlouse are the evidences of the dawn of mind and a conscious cerebration rather do we see in more or less elaborate reflex action that in its protective value to the animal has become enregistered Enregistration then, as a definitely useful reflex action is definable as the earliest beginnings of a subconscious mind Could we but measure the time interval that is the time occupied from the moment the stimulus was exhibited to the actual defensive response that period would be the "reaction time

A further evidence of revolutionary progress is the enregistration of more than one reflex action and with this would come a certain degree of selection and experimentation until such and such a response or series of responses, are graven in the animal's subconscious mind to be tried out and found suitable or wanting, as the case may be in any particular emergency A rabbit basking in its form in midfield relies on his protective colouring for concealment his only immediate response to the added menaces of his environment—the man, the dog, and the gun—may be but a closer crouching and he realizes but too late, that this response is inadequate and essays a belated scamper to the nearest hedge or burrow—*trial and error*

A further and more elaborate enregistered self-protective impulse is called a tropism, this is definable as the urgent adjustment of the individual to any drastic change in, or addition to his surroundings so that the body may retain its equilibrium a familiar example is seen in the way a cat will invariably light on its feet, no matter in what way its fall may be started and even if a 16-point turn be necessary in mid air And so as we progress from stage to stage in the evolution of animal life we see an ever growing "complex" in the reflex armature that is ultimately definable in man as his subconscious mind

Much of what we do in the ordinary daily round is purely automatic to coin an adjective tropistic *and* the way we do a thing must in the long run depend on the fitness of our subconscious cerebration with but a small contribution, when necessary from the conscious self —mind The air pilot the motorist the worker at a loom, all tend as their proficiency develops to consign a major portion of each task to the subconscious self Take for example, the motorist, his proficiency as a driver depends on the

[illegible] upwards. After sch[illegible] gunnery schools fm [illegible] of aim [illegible] time on aim [illegible] sight setting [illegible] Their actual [illegible] sea after qualifying are (*a*) [illegible] of [illegible] or smaller (*b*) any number [illegible] (G L) [illegible] (*c*) charge of a shell room or [illegible] (*d*) sightsetter at director [illegible] of his duties will naturally vary according to [illegible] happen to be in a destroyer light cruiser or turret [illegible] possibly every two years.

[illegible] *I II* An S G may be recommended for [illegible] his duties (G L II) are [illegible] his ultimate place [illegible] light cruiser (6 in) His [illegible] (4 in and above) [illegible] director trainer of a [illegible] (*b*) director trainer of a [illegible] *I II* may be recommended from a G L II at [illegible] This selection has now [illegible] responsible [illegible] (3 in and over) test [illegible] and laying and firing. His [illegible] for turret gun which may be fired [illegible] He should regularly [illegible]

[illegible] *I II* A G L II may be recommended for [illegible] all craft and bring ammunition from [illegible] G L II which has after preliminary [illegible] destroyer and [illegible] rifle or [illegible] though 4 in to [illegible] (single gun [illegible] or [illegible]

[illegible] light cruiser (*b*) [illegible]

[illegible] *I II* A G L II may be recommended for [illegible] selection very largely [illegible] His training is much [illegible] firing (single gun and [illegible] pounder and [illegible] He should regularly every three [illegible] D L [illegible] Admiralty p

[illegible] in the interests of the [illegible] to write [illegible] than to say that by [illegible] when the T D L [illegible]

L D L [illegible] as he [illegible] his tr[illegible] the training [illegible] full [illegible] tions from [illegible] the transmitting [illegible] control officer which are supplementary to [illegible] be seen that on [illegible] efficiency and accuracy [illegible] broadside fire will largely depend [illegible] gunlayers and [illegible] entirely subordinate to him and their duties are essentially [illegible] electrical pointers which are in themselves a reflection of the L D L or L D L efforts The L D L or L D L fires the broadside and does so in the instructions of the control [illegible] *via* the T S

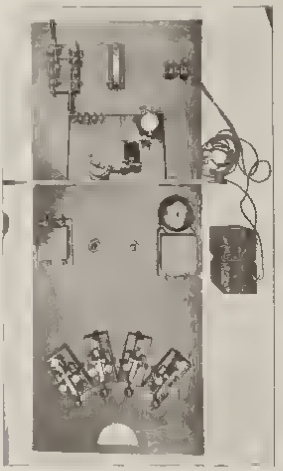
Transmitting room (T S) —This may be [illegible] ing house where all available information is [illegible] the final results sent to the director tower [illegible] that has any bearing on the information [illegible] speed of own ship speed of target ship wind [illegible] of target ship &c Individual results are [illegible] the scheme of things Conditions are naturally [illegible] the unexpected must always be looked for [illegible] of the many instruments and devices involved [illegible] this article It is enough if I again emphasize [illegible] element its alertness and its endurance [illegible] There can during action stations be no [illegible] must be constant and any failure of this [illegible] easily involve failure in the accuracy of the [illegible] forth

The T S officer must know everything [illegible] have a complete knowledge of each detail [illegible] only to the general trend of things but to all [illegible] sudden change that may take place in the information [illegible] him It should not be difficult to gauge the [illegible] Enough has, I think been said to sufficiently emphasize the efficiency of the more primitive factors in the [illegible] conscious mind are the *will instinct* I gave [illegible] inhibition and apprehension a little [illegible] stantly present whilst immediate memory and [illegible] play a part

Simple Reaction Time is defined as the [illegible] the exhibition of a stimulus (or signal) to the [illegible] (or signal) by the individual under test [illegible] divide reaction time into a central period (the interval occupied in [illegible] taking place within the brain) and a peripheral period or changes which occur outside the brain The central period is [illegible] reaction time Efforts at such discriminative calculation are [illegible]

sidered accurat[illegible] in three different mental processes—per[illegible] volitional release of the motor response.

Compositive Reaction Time is the time interval that elapses from the initiation of one of two or more stimuli to the recognition by the individual under test of the particular stimulus given. In this case inhib-



[illegible]

[illegible] discrimination—all are now involved. [illegible] such [illegible] then aim at measuring the goodness of a considerable [illegible] where a little [illegible] the conscious mind intrudes as a [illegible]

[illegible] Experimental Psychology [illegible]

A number of dit[illegible] experimented with du[illegible]

(*a*) A *recording d*[illegible] speed carrying a surfa[illegible] is drawn on the drum by a fine metal p[illegible] tuning fork with a known vibration accuracy [illegible] action period is recorded on the drum by a [illegible] wn away from the

1 2

drum as soon as the circuit is c[illegible] at the [illegible] the subject under test responds to the stimulus [illegible] been used by Sarpture in his work on reaction time [illegible]

(*b*) Where the time intervals are recorded by [illegible] chronoscope A chronoscope may be described as simply a [illegible] watch that

[1] Reaction Time in Nervous and Mental D[illegible] W Sarpture MD [illegible] the *Journal of Medical Science* October 1910

[illegible]

[illegible] parts of a [illegible] Edgar Square [illegible] was [illegible] a timing [illegible] time line [illegible] Ebbitt [illegible] ambit [illegible] [illegible] instrument [illegible] from that [illegible] in the photo [illegible] observing the [illegible] mounted on a [illegible] timing is con [illegible] ple of similar [illegible]

[illegible] will be seen [illegible] in a [illegible] each [illegible] the particular [illegible] —the [illegible] recorded in [illegible] were [illegible] there [illegible]

[illegible] glass plate [illegible] to a given signal [illegible] from the centre of [illegible]

[illegible] four way switch [illegible] The operator's master key [illegible] each an ebony plat [illegible] the chronoscope [illegible] the right of the watch (see [illegible] of the 4 volt accu [illegible] fixed on either side of the [illegible] held When energized the [illegible] there are two metal arms, well [illegible] electro magnet each of these [illegible] pivot [illegible] shield [illegible] the lower arm is attracted

[illegible] disc, [illegible] this [illegible] every alternate point [illegible] of the chronometers and thus

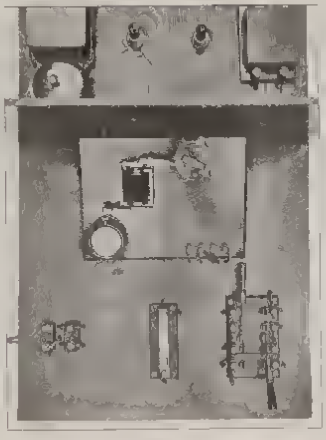


Fig. 3

preserves [illegible], the remaining pairs are merely insulating, but are put in to check the spacing of the contacts. The circuit-breaker resting on the chronometer is attached to the switch to which mentioned above and pivots round about the centre of the disc [illegible] and always touches one pair of brass cylinders.

Power for the four signals is furnished by a 20 volt accumulator (fig. 1).

Detailed diagram of the wiring would occupy an unnecessary

amount [illegible] and is therefore omitted. It will [illegible] however that the [illegible] experiments one for the [illegible] and for the [illegible] The working of the instrument [illegible] is simple —

[illegible] the bell into circuit and [illegible] the ends of the cross-piece [illegible] the [illegible] cylinder. The [illegible] at the other end

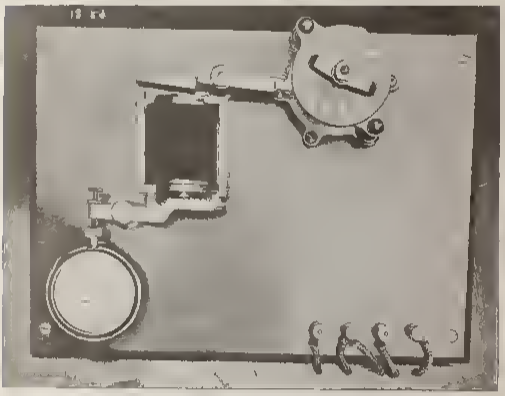


Fig. 1

of the screen has one hand resting on the [illegible] still. Either hand may be used but never both. Both operator and subject are seated and the instrument is resting on a suitably [illegible] table. The subject has been told to stand by for a simple reaction to the bell sound. The operator makes his master key and so instantaneously energizes the electro magnet; he thus causes the lower arm to start the chronoscope whilst simultaneously the upper arm trips one tooth of the ratchet wheel round so that the cross piece is moved from the dummy (insulating) pair of cylinders to a contact pair; the signal circuit is thus closed and the bell commences to ring. The electro-magnet is de energized at once on release of the master

[illegible] continues to run until the watch to record [illegible] [illegible] when he presses the right lever in doing so [illegible] [illegible] the electro magnet and so stops the clock [illegible] [illegible] the 1 to trip round another tooth and so in [illegible] [illegible] a pair of damping cylinders that break the bell [illegible] [illegible] and the watch set back to zero

[illegible] from the starting of the clock [illegible] [illegible] but latent periods [illegible] [illegible] 0·02 second for the buzzer were determined [illegible] [illegible] subtraction from each reading [illegible]

[illegible] that [illegible] standard reaction time [illegible] [illegible] may be exercised in [illegible] [illegible] actual task if the subject may vary [illegible] [illegible] time taken in springing from the position [illegible] [illegible] the [illegible] considered as a constant all [illegible] [illegible]

For [illegible] will be well to define the various statistical [illegible] the [illegible] which are in use [illegible]

(1) *The Arithmetical Mean* (M) is the sum of all values [illegible] divided by the number [illegible]

$$M = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

(2) *The Median* (Mdn) is [illegible] [illegible] [illegible] If interpolation is necessary [illegible] [illegible] will be halfway between the [illegible] and [illegible] theoretical value [N B —In the [illegible] have almost invariably been found situated [illegible] values]

(3) *The Mode* (Mde) is literally the [illegible] value

(4) *The Mean Variation or Mean Deviation* (v) is the [illegible] individual deviations from the mean [illegible] in a series

$$M_v = \frac{d_1 + d_2 + d_3 + \dots + d_n}{n}$$

(5) *The Standard Deviation or Root Mean Square Error* (σ) is the square root of the mean of the squares of each deviation from the [illegible] value

$$\sigma = \sqrt{\frac{d_1^2 + d_2^2 + d_3^2 + \dots + d_n^2}{n}}$$

[N B —In determining (4) and (5) the Arithmetical Mean of the [illegible] has always been used]

[illegible] is a considerable check on the reliability [illegible] expression of the general tendency of a [illegible] standard deviation [illegible] how well the [illegible] The standard deviation is usually [illegible] method and is more frequently used by [illegible] The standard deviation is always a little [illegible]

[illegible] disadvantage of the median is that it gives [illegible] deviations and may fail entirely to represent the [illegible] the longer the series the more symmetrical the [illegible] the more nearly does the median approximate to [illegible]

[illegible] from the above defined methods

	at	Squares of variation
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1 96
[illegible]	[illegible]	1 96
[illegible]	[illegible]	0 16
[illegible]	[illegible]	0 16
[illegible]	[illegible]	0 36
[illegible]	[illegible]	0 36
[illegible]	[illegible]	0 81
[illegible]	[illegible]	[illegible]
[illegible]	14	11 56
[illegible]	[illegible]	10 [illegible]

[illegible] 1 31 σ [illegible]

[illegible] 1 65

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] 25
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	10 25
[illegible]	[illegible]	210 25
[illegible]	11	10 25
[illegible]	[illegible]	6 25
[illegible]	[illegible]	6 25
[illegible]	[illegible]	6 25
[illegible]	[illegible]	12 25
[illegible]	[illegible]	1 5[illegible]6 25
[illegible]	[illegible]	10 [illegible]700 50

[illegible] σ $\sqrt{570\ 050}$

23 87

[illegible] of Mental and Physical Tests Part 1 [illegible]

[illegible] Example I do not show any unexpected tendency and the [illegible] of A, Mdn and Mde together with the smallness of [illegible] M [illegible] good indications of the nature of the series. In Example II on the [illegible] and the statistical expression reveals adequately the eccentric [illegible] and values. The extremes of the variates (values) must also [illegible] into account in any assessment though the Mv and σ studied with reference to the approximation of A, Mdn and Mde should [illegible] the central tendency in any series and the frequency of [illegible] extremes.

TABLE I.—VALUES OF WHOLE 100 FIRST 300 AND SECOND 300 WHERE NUMBERS DENOTE [illegible] PART OF [illegible] SECOND

[illegible]	A	Mdn	Mde	M			Extreme Values
A [illegible] 100							
S R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R [illegible] (Ins [illegible] [illegible] [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R [illegible] (Ins [illegible] [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B [illegible]							
S R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R T [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R T [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R [illegible] (Ins [illegible] [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R [illegible] (Ins [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C [illegible] 10—							
S R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S R [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R T (two [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R [illegible] (two [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R [illegible] (Ins [illegible] [illegible] and [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R T (all [illegible] [illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Seven hundred ratings were examined as to their [illegible] efficiency: these were mostly executive petty officers, [illegible] rates and men, together with a few commissioned and warrant officers. A small

number of the domestic ch[illegible] measure is the tendency [illegible] majority of specialized [illegible]

No man on the sick list [illegible] series The age mean was fro[illegible] cast rather between 9 a m and noon [illegible] times are, I think, with reference to [illegible] of maximal mental fitness It will [illegible] that the S R T (Simple Reaction [illegible] than that of a sound signal This is [illegible] largely due [illegible] the latent period in the developm[illegible] retina This is not seen in the [illegible] light signals has been made

Each rating was put through six [illegible]

(i) S R T —Sound (left
(ii) S R T Colou[illegible]
(iii) R T —Tw[illegible]
(iv) R T —Tw[illegible]
(v) R T —Thre[illegible]
(vi) R T —All four [illegible]

Each test was given ten t[illegible] that every subject had to respond to all sixty [illegible]

A reference to Table I reveals th[illegible] are somewhat longer than th[illegible] about explaining the as the [illegible] stantly watched [illegible] for any flaw or [illegible] eventually inter[illegible] Messrs Smith who suggested that [illegible] errors might be d[illegible] slight weakening of the meshing efficiency [illegible] of the very finely cogged [illegible] operating the stopping and starting mechanism of the chronoscopes [illegible] amount of "slip" [illegible] these wheels are kept in mesh by [illegible] springs Further the watches periodically required repair and [illegible] of the delicate impulse pins (two) set at right angles to the cogged wheels and impinging on the escapement

A broad consideration of Table I indicates that the "A" may be accepted as an expression of the general tendency of each series In no [illegible] Mv or σ excessive and especially will this be emphasized when [illegible] is made to the extreme values The Mv and σ will naturally be higher in the more complex tests where selection has to be made of three or four signals and the extremes are more divergent

It seems to me then that in the final expression the mean of "A, Mde and Mdn might be taken This is perhaps a trifle unorthodox in the application of statistical methods, but where approximation is reasonably close between the three all may be said to have equal claims Tables II

[1] Myers—Experimental Psychology—Vol I

[illegible] analysis of the first 350 in the [illegible] [illegible] groups.

[illegible] to alcoholism and reaction time [illegible] of alcoholism with those of normal [illegible] conclusions. It may be suggested that [illegible] beer produces a sluggish condition [illegible]

TABLE II. SCHANALYSIS OF FIRST [illegible]
WHOLE NUMBERS DENOTE [illegible] PART OF A [illegible]

	A	Mds	Md	M			
S I [illegible] —							
I [illegible]	15 3	34	34	4 07	[illegible]	[illegible]	[illegible]
I N [illegible]	36	33	35	3 96	[illegible]	[illegible]	[illegible]
T I [illegible]	11 7	31	31	3 [illegible]	[illegible]	[illegible]	[illegible]
I E N [illegible]	11 9	32	34	3 71	[illegible]	[illegible]	[illegible]
C H O [illegible]	8 0	33 and 37	34	3 40	[illegible]	[illegible]	[illegible]
C H [illegible] C	32	Not determinable	32	2 0	[illegible]	[illegible]	[illegible]
I fro [illegible]	11 89	33	34	4 22	[illegible]	[illegible]	[illegible]
S I [illegible] —							
T C [illegible]	[illegible]	31	17	4 31	[illegible]	[illegible]	[illegible]
T N C [illegible]	[illegible]	40	35	4 86	[illegible]	[illegible]	[illegible]
T I [illegible]	15 1	31 31 35 40	33	4 01	[illegible]	[illegible]	[illegible]
I E N C [illegible]	[illegible]	32	37	4 73	[illegible]	[illegible]	[illegible]
C H O [illegible]	15 [illegible]	41	35	5 90	[illegible]	[illegible]	[illegible]
C H O N [illegible]	[illegible]	37	36	2 10	[illegible]	[illegible]	[illegible]
D [illegible]	[illegible] 77	31	39	3 91	[illegible]	[illegible]	[illegible]
R T [illegible] —							
T G [illegible]	[illegible]	[illegible] 18 [illegible]	51	4 70	[illegible]	[illegible]	[illegible]
F N G [illegible]	[illegible]	48	50	[illegible]	[illegible]	[illegible]	[illegible]
I I G [illegible]	[illegible]	[illegible] 53	48	0 [illegible]	[illegible]	[illegible]	[illegible]
T F N G [illegible]	[illegible]	[illegible]	18	[illegible]	[illegible]	[illegible]	[illegible]
C H O [illegible]	[illegible]	[illegible]	50	3 80	[illegible]	[illegible]	[illegible]
C H O N [illegible]	[illegible]	[illegible]	[illegible]	3 80	[illegible]	[illegible]	[illegible]
D [illegible]	[illegible]	8	18	1 81	[illegible]	[illegible]	[illegible]

[illegible]

TABLE IIA.—SUBANALYSIS OF FIRST 350

WHOLE NUMBERS DENOTE $\frac{1}{100}$ PART OF A SECOND

[illegible]	A	Mdn	Mdn	Mv	σ	Total	Percent.	Extreme
[illegible] (two sounds)—								
I G	56 20	54	54	5 96	7 92	219	62 57	30—85
I N G	59 10	56 58 60	58	5 84	8 74	51	14 57	42—80
T T G	57 08	52	55	8 29	7 71	48	13 71	42—82
T T N G	57 70	52 53	53	8 89	12 21	17	4 85	13—95
C H_2O G	54 60	52 53	53	10	12 86	10	2 85	[illegible]—85
C H_2O N G	57	Not determinable	58	5 10	7 80	5	1 42	13—[illegible]1
[illegible] (in all groups)	54 62	58	53	5 31	7 12	86	24 57	12—81
T [illegible] (one sound lights and [illegible])—								
T [illegible]	64 03	61	61	7 24	9 91	219	62 57	46—112
[illegible]	66 07	56	62	9 15	11 36	51	14 57	40—90
[illegible]	66 [illegible]	51 57	66	8 20	9 68	18	13 71	49—92
[illegible] N G	68 [illegible]	63 61	60	7 98	9 55	17	4 85	53—86
[illegible]	70 60	Not determinable	67	13 1	13 02	10	2 85	51—96
[illegible] N G	69 60	Not determinable	70	10	11 38	5	1 42	57—83
[illegible] (in all groups)	60 33	57 60 61	60	5 56	7 59	86	24 57	40—81
[illegible] (two signals)								
[illegible] G	72 18	65	64	8 81	11 52	219	62 57	52—113
[illegible] N G	71 19	74	73	8 42	11 84	51	14 57	56—105
[illegible]	75 18	61	71	9 13	11 38	48	13 71	54—102
[illegible] N G	72 58	61 69 78	69	9 98	13 56	17	4 85	51—115
[illegible] H_2O G	80 60	79	73	7 6	9 45	10	2 85	51—95
[illegible] H_2O N G	70 40	Not determinable	73	8 60	9 60	5	1 42	58—90
[illegible] (in all groups)	67 35	65	67	5 61	8 84	86	24 57	54—94

[illegible] are —

(i) Temperate	Games (T G)
(ii) Temperate	No games (T N G)
(iii) Teetotaler	Games (I T G)
(iv) Teetotaler	No Games (I T N G)
(v) Alcoholic	Games (C H_2O G)
(vi) Alcoholic	No games (C H_2O N G)
(vii) Deliberate	Taken from all groups (D)

These [illegible] been largely sort[illegible] influenced by the [illegible] from personal [illegible] the party information [illegible] V and VI [illegible] the number [illegible] shall take [illegible]

Sequence [illegible] of opinion [illegible] made [illegible] probable [illegible] one signal [illegible]

Group VII — [illegible] I have use[illegible] I consider to be [illegible] type He has [illegible] the T G [illegible] and [illegible] Briefly his event[illegible] never any evidence [illegible] cluster, he rarely [illegible] striking the correct [illegible] His S R T is not [illegible] but it is rather in the more complex tests [illegible] further reference to Table IIA will confirm this [illegible] bly lower A Mde and Mdn The M[illegible] and [illegible] and suggest—is is definitely the case—[illegible] about the mean and a small incidence of extreme [illegible]

Further dissection of these tables can only [illegible]

I am a little hesitant in suggesting to what extent [illegible] standards should be adopted in assessment That *some* [illegible] accepted I feel convinced The degree of latitude that is [illegible] either side of a mean is I think a matter for very careful [illegible]

As far as T I N G C H_2O G and C H_2O N G are [illegible] numbers dealt with in tables II and IIA are hardly [illegible] indicative of the tendency of the series

The second instrument made for me in *Excellent* and [illegible] range of attention immediate memory perception [illegible] tiation and mental alertness In general such a device [illegible] determine the subject's capacity to perceive visual objects [illegible] when the conditions are limited by short temporal [illegible] stimulus [illegible]

Put into simpler language an excellent example of real [illegible] the above attributes is I think the almost uncanny ability [illegible] women have of taking stock of each item in a [illegible] when the opportunity for such inspection may last but [illegible]

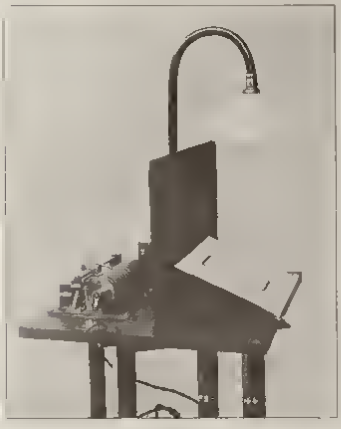
Technically such an instrument is known as a [illegible] function is to expose one of a series of test cards [illegible] for a known period of time Many points have been [illegible] a good instrument some of these are (1) The [illegible] should be noiseless and free from distraction [illegible] (2) the [illegible] stimulus should be short enough to prevent forming [illegible] exposure to all parts of the field should be simultaneous [illegible]

Whipple Manual of Mental and Physical Tests [illegible]

From the Greek [illegible]

[illegible] card should be such that it does not appreciably disturb the [illegible] of the subject (a) the subject should be given a ready [illegible] the exposure of the test card (b) the exposure field must [illegible] field of direct vision (binocular vision only has been used [illegible])

[illegible] Whipple stipulates that if retinal adaption is to be favourable [illegible] from light to light must be avoided. This may be so [illegible] a factor will be a constant, and as such, not alter [illegible] ions formed by statistical result.



[illegible]

[illegible] Whipple's [illegible] types of [illegible]

[illegible] tachistoscope [illegible] the test card [illegible] [illegible] [illegible]

[illegible] INTERPRETATION OF A MENTAL [illegible]

[illegible] TM RICCAI [illegible] BN Reader
Member [illegible] Brooklyn Institute
[illegible]

[illegible] analysis since the termination of [illegible] technique This [illegible] the various schools of psycho[illegible] psychology in the medical [illegible]

[illegible] would undoubtedly be the best [illegible] various school Those of us [illegible] have discover some of the [illegible] representative [illegible] The materialistic Freudian [illegible] to call the philosophical religions and mystical [illegible] followers of [illegible] not understand why the [illegible] the plant we dream is reduced to the [illegible] difference [illegible] the term of repression from the [illegible] the Freudian unconscious [illegible] transcendental and somewhat [illegible]

[illegible] to the opponents of the Freudian school is, of [illegible] sexuality This criticism is mighty ble [illegible] aesthetic complexes which we all [illegible] degree Part of this criticism is [illegible] The psychoneurosis is [illegible] for sexual connection Love [illegible] sexual instinct can exist without [illegible] I maintain therefore that it is [illegible] this wide Freudian concep[illegible] *the word sexuality in the same word love*

[illegible] conception of sexuality is reduced it [illegible] ground

[illegible] point is carry said of symbolic [illegible] generally accepted in psycho[illegible] [illegible] of dissociated [illegible] to cases to exist when [illegible] We [illegible] teaching [illegible] nature connected with [illegible] then bases the conflict [illegible] and repression [illegible] repressions [illegible] principle [illegible] In this [illegible] concretic sympt[illegible] [illegible] sense symbolic [illegible] the chief feature [illegible] necessitate of this [illegible] to

[illegible] into useful channels. Even on [illegible] attached to the abreaction of [illegible] the physician. I contend that [illegible] analysts, are as brilliant at not more [illegible] branch of medicine. The result of [illegible] the analyst has had in the [illegible] instances and [illegible] or [illegible] technique has must also [illegible] role and [illegible] low emotion of any kind. It is [illegible] that the weakest spot [illegible] that first been analysed. During [illegible] he should be counter [illegible] has own complexes as their [illegible] by his patients assent [illegible] the mechanism of transference. The [illegible] technique is practically [illegible] resistance and secondly the [illegible] of the symbols [illegible] the crude [illegible] origin. The [illegible] synthetic methods secure [illegible] on patients at this [illegible] alone [illegible] that our patients [illegible] hopeless psychoneurotics [illegible] normal human beings. But secreting and [illegible] repression of the [illegible] enabled to sublimate [illegible] character. The unconscious [illegible] primitive infantile [illegible] enough to enable him to build up for himself. Analysis [illegible] code of morality [illegible] education. I believe it to be [illegible] but materialistic and secular [illegible] which has changed [illegible] mism.

The inevitable [illegible] takes place in the same way as the social mental development [illegible] resemblance to [illegible]. The neurotic [illegible] have [illegible] importance to [illegible] the crude [illegible] the behaviourist [illegible] and biologist.

The psychoanalyst [illegible] whole [illegible] neither the [illegible] of [illegible] mutual [illegible] upon [illegible] emotions amongst [illegible] all this [illegible] of [illegible] simple [illegible] psychologist.

The psychoanalyst [illegible] of philosophical [illegible] leading [illegible] theory.

A comparison [illegible] help [illegible] symbolism [illegible] permitted [illegible] myth [illegible] dichotomy [illegible].

To [illegible] clinical [illegible] I would suggest [illegible] time of [illegible] Has [illegible] sudden [illegible] keen or [illegible] it from [illegible] our [illegible] gastro [illegible] stion [illegible]

[illegible] on the medical [illegible] to the limitation to [illegible] a narrow [illegible] the nature [illegible] and motor [illegible] stories and [illegible] significant that this [illegible] and theory and notions [illegible] number of those who think [illegible] and knowledge of [illegible] and play is founded on [illegible] hesitate from

[illegible] to psycho analysis is [illegible] conclude with a few [illegible] analytical [illegible] illness

[illegible] *neuroses* the former [illegible] components of the [illegible] of psycho analysis [illegible] sional neurosis [illegible] force neuroses [illegible] to another [illegible] ing and [illegible] psychogenic [illegible] and [illegible] and dement [illegible] the [illegible] to hell, [illegible] the reality [illegible] that the [illegible] If the [illegible] neuroses and [illegible] may conceal [illegible] a protec [illegible] the protecting [illegible] depres [illegible] that existing [illegible] dementia prec [illegible] present different [illegible] on

Naval Medical History of the War

SURGICAL SECTION (*continued*)

EDITED BY REAR-ADMIRAL A. GASTHORNE WILDEY, C.B., R.N.

PART II.—WOUNDS (*continued*)

(a) THE GENERAL EARLY TREATMENT OF WAR WOUNDS (*concluded*)

By SURGEON CAPTAIN MONTAGUE J. B. RODDIE, R.N.

(*Continued from p. 143.*)

General Considerations

Observations and conclusions gathered from the experiences of many Naval surgeons are here grouped under several headings.

(1) *Condition of wounded on admittance.—Effects of first aid they had received.—Comparative value of the early antiseptics which had been employed.—Length of time that had elapsed since the injury.*

The condition of wounded on admittance varied considerably. Many suffered from shock due to immersion other than that caused by their wounds, whilst many showed the effects of transport. With very few exceptions all the wounds inflicted by bullets or other projectiles were septic, and more particularly in the early stages of the war a great number of cases on admission to hospital showed signs of mild toxæmia. From this it can be regarded that all war wounds are septic and should be treated as such. Antiseptics were in general used, but whatever their value as a first aid sepsis invariably supervened sooner or later in the majority of superficial wounds and in those caused by bullets. It is recognized that little more than first-aid treatment can be attained during an action between hostile ships in a naval action, and it is obvious that the application of an antiseptic dressing, although it might prevent the entrance of fresh infective material, is quite inadequate to deal with sepsis in the interior of the wound.

Bipp and flavine produce the best results, and should, if used strictly according to the technique laid down (Ashdown), be used.

In the hospital ship *Plassy* after the Dathul Lithi found in an engagement forty-two hours after the engagement, then so far as actual primary surgery was concerned there was little to do. In the majority of the cases requiring operative treatment had occurred during or shortly after the action. The wounds which were aseptic required no further treatment, while the septic wounds were horribly septic and unsuitable for any operative treatment. The wounds had been mostly treated with hypo

[illegible] though other uses had been treated with iodine or boracic [illegible] of records stating what treatment had been adopted a guess [illegible] made as to the initial treatment which had been employed [illegible] the keynote of successful early treatment is, undoubtedly, [illegible] but of course the condition of the patient and the number [illegible] treatment at the moment may prevent the attainment [illegible] Where devitalized tissue or any foreign body had been [illegible] the recesses of the wound had been thoroughly packed [illegible] the results were good Where such measures [illegible] wounds were in a condition of acute virulent sepsis upon arrival in hospital ship Thorpe and Barlow at Plymouth Hospital, found the [illegible] patients admission after being wounded varied from three to [illegible] eight hours The cases received had little opportunity for first-aid treatment [illegible] than the control of hæmorrhage, rough splinting of fractures and application of dressings with or without iodine and the administration of morphia Such cases were generally received six to eight hours after injury and suffered from a certain amount of shock not so much due to the wounds as to the immersion following upon the injury and the transfer from two boats to the rescuing destroyers or trawlers where alone the facilities for their proper treatment were slight Other cases in which a longer time had elapsed came from torpedoed [illegible] vessels [illegible] Here little opportunity for first aid treatment was given In spite of this as a rule the general condition of [illegible] was fairly good

Stephens found the condition of the wounded varied according to the [illegible] that had elapsed since the injury Physically it was remarkably good [illegible] amount of shock varied according to the severity and extent of injury [illegible] hæmorrhage and when they suffered from burns as well [illegible] small superficial flesh wounds treated by first aid had excellent results [illegible] with iodine covered with tannin gauze In extensive deep [illegible] of the tissues first aid is [illegible] of value in preventing further infec[illegible] and [illegible] hæmorrhage by pressure The principal value lies in [illegible] urgent [illegible] the amount of the cases and the amount [illegible] before [illegible] that [illegible] organize hospitals operating theatres and [illegible] the necessary [illegible] in the minutiæ The length of [illegible] before [illegible] was applied from time of injury in a ship may be [illegible] as an average [illegible] of an hour They may be seen within [illegible] minutes or have to wait [illegible] and a half hours according to the progress of the return the accessibility of their station and the relative nature of [illegible] casualties

In the hospital ship *Elvira* in October 1914 I received a large number of French and Belgian wounded direct from the trenches at Dixmude Their condition was deplorable and the septic wounds in these early days I found thought in discussion Shock was not very

[illegible] Three cases of tetanus [illegible] in injury some cases later [illegible] splinting for fracture [illegible] The technique employed [illegible] is well described in the paragraph. The antiseptics used were iodine, carbolic, and bichloride. A fairly large number of wounded were received at the Royal Marine [illegible] from destroyer actions, mine sweepers and after Zeebrugge. The cases were received from ten to thirty-six hours after injury. Shock was not marked except in abdominal cases, multiple wounds and after amputation. Iodine painting was never the dressings which had usually been applied before admission. Accurate and good splinting in fractures. The [illegible] of these cases was always well planned and carried out until the medical officers at Dover observed the greatest care. Antiseptics used after admission were iodine, carbolic, flavine and bipp. They are all moist, special but they vary in their usefulness. In superficial wounds iodine alone is sufficient. Where there is suppuration which must necessarily remain continuous carbolic was used. For primary suture I consider bipp to be the best antiseptic.

(2) *Safe Limits for Primary Suture in Naval Cases.*—Axmann considers the limit of safety for primary suture is the measure of excision of the wound. The sooner the wound is excised after infection the less risk of infection. If complete excision can be effected primary suture may be safely employed and union by first intention obtained. I follow and I may consider the time limit for primary suture could not be judged since in their cases all were treated by free excision and primary suture with successful results in the majority of cases and in those in which the suture had to be released no harm was done and time was gained in the healing of the wound, thus the rule was to employ primary suture.

Stephens considers the safe limit in naval cases depends entirely on the skill of the surgeon in sterilizing the wound. When primary suture was first employed it was judged safe to suture within twenty four hours. Later the limit was extended to forty eight hours and he gives as the rule of cases the time which has elapsed since the wound was inflicted is of little consequence, wounds older than twenty four hours healed in precisely quite as good as fresh wounds. The decision has to be made in each of the wound. If there is the slightest suspicion of gas gangrene or tetanus suitable for primary suture. The size of the wound presents no limit, only if suture would result in undue tension in small limb feet and hands, the toes and soles are unsuitable. Unfavourable results often followed if there is a fracture of the femur.

(3) *The Question of Drainage.*—In primary suture no drainage is used. In all other cases, unless secondary suture is practised, it is essential.

(4) *The Preparation of the Patient for Operation.—The Surgeon's Hands and the Sterilization of the Wound with the Knife.*—In hospital practice and in hospitals I have used the following method. The skin around the

[illegible] and for a considerable area beyond is shaved and scrubbed with [illegible] with æther soap The ether is removed with 1 in 500 [illegible] and the skin again rubbed with spirit dried and the whole area painted with iodine and wrapped in sterile towels If the patient is conscious this preliminary toilet is made in the ward If not, it is done in the operating theatre after the patient has been anæsthetized If [illegible] in the ward—after the patient has been anæsthetized—the towels [illegible] and the part again painted with iodine and the whole operation area covered with sterile towels leaving only the wound exposed [illegible] the wound has usually a margin of necrotic tissue infected with [illegible] organisms This necrotic area is removed by excision but as sparing as possible especially over a large area as its loss may mean a good deal to the ultimate result The wound is then freely opened up and all foreign bodies and loose pieces of bone removed All devitalized muscle and tissue is excised away freely not only the necrotic but also those areas which are devascularized and non contractile because it is in tissues in this condition that the worst sepsis commences All bleeding vessels are secured with Spencer Wells forceps and tied with catgut When the resection is completed and all foreign bodies removed the raw surfaces are swabbed with 1 in 40 carbolic and afterwards with spirit The whole wound surface is again rubbed with "bipp" on a piece of gauze, avoiding any excess The wound is then sewn up the divided muscles are approximated with catgut, and the skin sutured with silkworm gut [illegible] is applied to the surface with dressing of gauze, wool and bandage, [illegible] furnishes suitable splints as necessary

Axford considers the preparation for operation to be much the same as that practised in pre war times except that iodine was very little used while "bipp" was employed carbolic preparation being then preferred for other cases picric acid solution (5 per cent), or Cheadle's malachite green spray (a mixture of equal parts of a solution of malachite green [illegible] per cent in 80 per cent rectified spirit with a solution of mercury perchloride (2 per cent) in 80 per cent rectified spirit were applied after the final cleansing with soap æther &c

Parlow and Thorpe as a routine used soap and water bimiodide of mercury spirit æther and iodine but occasionally eusol or Dakin's solution was used throughout

Willan considers the question can be answered under the heading of "bipp" since Rutherford Morison's discovery that wounds after removal of devitalized tissue, and properly prepared and treated with "bipp" can be closed without risk has been revolutionary Had this method been employed in the fighting ships in the battle of Jutland it would have been a godsend to patients and to the medical staff Not only is "bipp" superior to all other methods of combating sepsis but patients so treated require no further dressing for many days after the initial treatment a very great advantage when working with a limited staff and dealing with a

large number of wounded After the Jutland action the surgical staff were too busy attending to the general comfort of the patients to redress their wounds consequently by the time they were evacuated to hospital the gauze dressings were inert and no longer antiseptic The only disadvantage of 'bipp is that bismuth or iodoform poisoning may follow if the paste is too soft or applied too lavishly Willan had seen only one case of such poisoning the patient improved immediately the bipp was removed, and made an uninterrupted recovery The failures with 'bipp can certainly be ascribed to failure to carry out the proper technique Instead of rigidly following Morison's directions the surgeon is tempted to vary them (*e g* syringing out the wound with carbolic solution or other antiseptic) to the detriment of the wound and the unfair condemnation of the method Just as he was a firm advocate of 'bipp so was he equally convinced that a 20 per cent solution of carbolic acid was the best all round skin antiseptic for war wounds it has the advantage of being also an excellent substitute for soap when removing hair with the razor

Stephens considers that the preparation of a patient for operation in a ship is hardly possible if large numbers of casualties have occurred He further considers that sterilization by the knife should not be attempted in a ship as it opens up fresh paths of infection Rigid asepsis is unattainable The tissues are probably already seared by the high temperature of the shell fragment

(5) *The Utility of Antiseptics in Early Cases*—Stephens considers iodine ideal for superficial wounds If the wound has to be flooded with an antiseptic Dakin's solution is the best Eusol or one of the hypochlorites is good Sterilization of the skin with bichloride spirit and iodine is probably the most important asset in the future progress

Axford considers antiseptics are doubly necessary from the beginning It cannot be doubted that war wounds are infected at the time of infliction and that infection spreads very rapidly and becomes firmly established a thorough antiseptic treatment is therefore required Suture without such treatment leads to disaster

Barlow and Thorpe state that where complete excision was impossible or inadvisable piecemeal excision was attempted but before this an attempt was made to render innocuous the infected part with pure carbolic acid and when devitalized tissue had been removed as far as possible and when all tracks were opened up and foreign bodies extracted and the wound flooded with either saline or Dakin's solution the procedure is very effective It had always to be borne in mind that an endeavour should be made to preserve as far as possible, the functional activity of the part affected Thus where large vessels and nerves were intact although possibly infected they were cleaned as far as compatible with their preservation reliance being placed on the after-drainage and irrigation to render innocuous any infection which might remain

Where joints were affected primary excision was not considered

[illegible] and propl[illegible] [illegible] primary suture

[illegible] —In wounds complicated by [illegible] foreign bodies, &c Axford's own [illegible] other antiseptics particularly [illegible] duced successful results Loss of [illegible] but neither loss of bone or [illegible] In the latter case coaptation of the [illegible] to extreme tension even [illegible] cases partial suture was [illegible] left open, dressed antiseptically [illegible]

Wilm[illegible] [illegible] described is the method of bone

Barb[illegible] [illegible] number of antiseptic fluids and past[illegible] [illegible] sublime, enol and Dakin's solutions [illegible] mide solution iodine and the fluid[illegible] and bipp found [illegible] satisfactory results in all types of

[illegible] cases apart from war [illegible] with most rembl[illegible] results

[illegible] It was early realized in [illegible] that the [illegible] was so great that anti[illegible] treatment [illegible] logical and other [illegible] was due to the dead [illegible] with a foreign body [illegible] which has so [illegible] Antiseptics here [illegible] the removal of foreign [illegible] free excision of all the devitalized [illegible] The removal of the dead tissue at on[illegible] the invading organisms level, and at the st[illegible] further invasion by setting up a strong fore[illegible] and which allowed of primary suture

Axford considers re[illegible] necessary as forming both a feeding and [illegible] of the wound

Barbu and Thorp[illegible] complete excision was possible after the [illegible] primary suture should be employed [illegible]

Willm considers steri[illegible] and advocates 'bipp as previously describ[illegible]

[illegible] *Devitalized* [illegible] *with Brilliant* [illegible] very [illegible] used brilliant green for irrigating [illegible] The [illegible] insufficiently noticed instances were observed [illegible] where [illegible] the [illegible] tissues thus the surgeon was [illegible] that [illegible] the [illegible] damaged tissue that other [illegible] [illegible] Personally I have not used the method. Wright [illegible] brilliant green for stump [illegible] [illegible] surgeons have [illegible] the method.

(9) *Incisions of Incisions* [illegible] *Wound* [illegible] Axillary abscesses the black [illegible] should be [illegible] [illegible] by the enlargement of the [illegible] [illegible] of possible. The position of the incision is governed by the [illegible] relations of the wound area. [illegible] wound the [illegible] incision was difficult or dangerous. The [illegible] passing a gauze wick stuffed in [illegible] the [illegible] from imminent [illegible] was disturbed [illegible] [illegible] procedure.

(10) *Sutures and Dressings*.—I have used [illegible] vessels and [illegible] the skin wound [illegible] with [illegible]

Antiseptic dressings [illegible] applied [illegible] 1000 or 1 in 4000 [illegible] were [illegible] this [illegible] [illegible] with spirit gauze [illegible] with sterilized [illegible]

Stephens used silver [illegible] for intestinal wounds [illegible] able to cymric [illegible]

William used catgut [illegible] carbolized [illegible] dressed with dry sterile gauze. [illegible] tion of perchloride [illegible]

Burlow and Hoppe [illegible] worm gut for the skin. [illegible] tension sutures of [illegible] lineading through [illegible] Where primary [illegible] in Dakin's solution [illegible] with bandages.

(11) *After-treatment* [illegible] and no case in which [illegible]

[illegible] is placed beyond doubt. This should [illegible] the removal. In some cases the stitches [illegible] the fifth day. There is usually some rise [illegible] in a slight rise of temperature and pulse [illegible] and in nothing else unfavourable arises it [illegible] the wound. If pressure the wound must be [illegible] the most [illegible] condition of the edges [illegible] may be [illegible] and left untouched. If the case is not pro[illegible] satisfactorily the edge of the wound will be red, and probably [illegible] delineations. The temperature and pulse rate also have not come [illegible] Primary union may then be assumed to have failed and the [illegible] gaping wound. The failure is due to [illegible] causes some beyond [illegible] but usually to insufficient resection of the tissues. Accurate [illegible] is necessary.

[illegible] Unless contraindicated where primary union has [illegible] wounds should be sutured until the stitches were taken out [illegible] Whenever it was evident that healing was [illegible] the wound was freely opened up and Carrel Dakin [illegible] instituted.

[illegible] that a keen watch for secondary hæmorrhage and also [illegible] should be kept.

[illegible] the after treatment varies according to the method [illegible] Antiseptic or the less interfering method for the wound [illegible] present. A great advantage of the Carrel method is that the [illegible] for seven days but in days or even longer with a [illegible] removal of finding the wound healed *per primam*. If [illegible] the removal of the sponge gauze dressing is necessary [illegible] injection but pyoxanin compounded by pain or other [illegible] alum removal of dressings. With flavine the [illegible] may be left for a few days provided it is kept moist by the [illegible] of the solution from time to time. With eusol or Dakin's solution [illegible] they quickly split up in contact with wound secretions [illegible] renewal by simple gauze irrigation is repeated and suture should be delayed.

[illegible] Cases by Thomas [illegible].—(1) A case of compound comminuted [illegible] of the right frontal region with [illegible] fragments and marked laceration [illegible] is admitted in a state of collapse and marked Jacksonian epilepsy [illegible] The torn scalp was shaved and the whole wound was kept flushed [illegible] throughout the operation. Loose fragments of bone [illegible] flap of dura and scalp excised and scalp united with interrupted [illegible] Although no other antiseptics were used and no drainage [illegible] wound healed by first intention and patient made an excellent [illegible]

(2) A [illegible] three days after injury—had received a compound [illegible] of the right frontal region with exposure and protrusion of the [illegible] brain—who was the only method available—[illegible] Thus performed with his usual dilatorius

[illegible] All lights had been extinguished [illegible] These candles were held by [illegible] to be replaced as this collapsed [illegible] On admission to hospital [illegible] and healed well and patient [illegible] a comatose [illegible]

[illegible]

[illegible] After the [illegible]

[illegible]

(2) [illegible] Operation [illegible] together with [illegible] which was [illegible] drainage. Wound healed [illegible]

This paper has been [illegible] to and including primary [illegible]

establish [illegible] have not been mentioned—although some cases necessarily [illegible] to another. These cases however are being dealt with by other medical officers. The notes have been purposely arranged under headings [illegible] individual officers to give their experiences which [illegible] repetition and overlapping; this was unavoidable and [illegible] it brings out prominently how much the same was [illegible] by the various medical officers. From these separate [illegible] that all war wounds are infected, and must be treated [illegible] and rigid surgical toilet, and that primary [illegible] of choice and should always be employed where [illegible] not to employ drainage where primary [illegible] and that dressings are most satisfactory. Rest [illegible] after primary suture is essential and the patient [illegible] would be healed. The general conclusions to be [illegible] in the various hospitals &c. in war time [illegible] from the Army experiences in that the Navy [illegible] civil hospitals in previous days [illegible] be treated in similar lines. Thus we [illegible] primary suture after more or less complete [illegible] removal of foreign bodies, and have not [illegible] operations of similar nature in order to [illegible] complications. Thus it will seem to be largely [illegible] of treating wounds the general condition of [illegible] much better than that of the Army as they [illegible] continuous touch with civilians under all [illegible] cleanliness of person and of [illegible] these wounds have not [illegible] sepsis. Thus we have had no cases [illegible] fortnightly serum as a routine. In [illegible] possible for the wounded to receive more [illegible]

[illegible] that as far as the treatment of naval [illegible] changes in our methods are [illegible] but they think that much remains [illegible] men who by better facilities [illegible] patients on board [illegible]

Clinical and Practical Notes

A SUGGESTED SCHEME FOR THE STANDARDIZATION OF THE TREATMENT OF SYPHILIS IN THE NAVY

By Surgeon Lieutenant Commander A. J. Towler, R.N.

Everyone will agree as to the vital necessity of adopting one standard method of treatment for this important disease. Already in the Service there is sufficient diversity of opinion with the result that the patient gets somewhat confused and loses confidence in the treatment, a condition of mind inimical to success.

The actions of the drugs mentioned in this paper and the arguments I have put forward will, I trust, at any rate justify a careful analysis. There is ample evidence to show that the long deck listings have great confidence in the treatment of N.A.B. and if this is to be retained it is imperative to settle the matter as soon as possible.

I propose to review the treatment under the following headings:—

(1) Antisyphilitic drugs and adjuvants.
(2) Methods of administration.
(3) Treatment according to the stage of the disease.

The following drugs will be considered: mercury, iodide of potassium, intramuscular arsenical preparations.

Mercury.—This drug is no longer regarded as the one hope to suffering from syphilis. Although in the past a number of cases have been cured by the use of this drug, there are, in too many cases, in which it may not only prove useless but actually give rise to most unpleasant symptoms.

For myself, I am opposed to the use of mercury in all cases, under the conditions, on the grounds that it does not fulfil the ideal treatment, thus making it impossible to place any reliance on the Wassermann test, and that the most satisfactory results can be obtained by the use of N.A.B. alone. At the same time one is obliged to realize that many eminent syphilologists are still using mercury in conjunction with N.A.B., and it is therefore the lesser evil to pick up the crumbs of it till more definite evidence is available.

Potassium Iodide.—Whilst not possessing any specific properties, this drug, when used in moderate doses, is a valuable adjuvant in the treatment of chronic syphilis. It helps to get by absorbing the exudative tissue formed in the flesh of the gumma. *Spirochaeta pallida* is neither killed nor even scared by iodine, and it is well known to discuss for this reason the almost miraculous effect of potassium iodide on syphilitic lesions of the skin.

Intramuscular Arsenical Preparations.—There is no doubt, in my mind, that McDonagh's preparation, discovered in those days of salvarsan, the body tissue, in presence of inflammatory disease, has the property of forming the organic compound to the activity of the organic and the inorganic radical, the sulphur radical. If applied to the treatment of syphilis and for my opinion that in those syphilis for which it is intended apply, it is owing to the mistake to state, and then [illegible] the sulphur, the detoxicant by means of [illegible] and results are [illegible] though it is true [illegible] do know that [illegible] has [illegible] condition is as [illegible] administration of N.A.B. [illegible] advantageous of N.A.B. [illegible]

Intramuscular Injections.—Of the three preparations the most [illegible]

[illegible]

[illegible]

[illegible]

[illegible] and [illegible] the slightest [illegible] [illegible] specimen [illegible] tact with the [illegible]

[illegible] dark [illegible] and [illegible] with the [illegible] [illegible] [illegible] colour [illegible] [illegible] the [illegible] [illegible] spirit [illegible] [illegible] At the slide the [illegible]

[illegible] microscope slide [illegible] drop [illegible] [illegible] flat [illegible] paper [illegible] high [illegible] [illegible]

All [illegible] examinations should [illegible] made with [illegible] three [illegible] larger field and the object more sharply [illegible] illuminated.

A [illegible] [illegible] made the field [illegible] dark ground [illegible] and the source of light so arranged that a circle of light [illegible] the plane mirror.

A drop of cedarwood oil is next placed on the top of [illegible] another drop on the under surface of the slide to be examined [illegible] is placed on the stage of the microscope, condenser being slowly [illegible] the two drops coalesce.

When using the 1/6 objective no oil is placed on the upper surface of the slide.

The objective is then racked down close to the slide and the mirror manipulated until the light is found to [illegible] the centre of the [illegible]. Focussing should then take place. [illegible] [illegible] locus [illegible] can be [illegible] adjusted [illegible] [illegible] cells [illegible] &c. [illegible] on a black background.

The [illegible] will be [illegible] [illegible] and [illegible] and the spirochaete will also be recognized [illegible] [illegible] and their typical movement. It will of course be necessary to distinguish between this [illegible] and other [illegible] often [illegible] the same slide.

To [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] is obtained.

At first this [illegible] [illegible] specks of [illegible] bubbles [illegible] necessary to [illegible] the right focus. This is readily recognized by observing the large [illegible] actively in the cone. Before pronouncing a negative opinion at least [illegible] separate examinations should be made on different dates.

ELECTRICAL ATTACHMENT FOR STERILIZER OF BOYTON'S TYPE

By Surgeon Lieutenant J. F. AINLEY, M.B., R.N.

This method of generating the necessary heat for sterilization has been found useful when the sterilizer is required for any length of time as in [illegible] work.

The apparatus can be kept going for several hours if necessary, and hot water is always available for preparing fomentations, &c., as well as for boiling instruments. This is not possible if the spirit lamp is used.

There is one disadvantage however, the electric heater takes about twice the length of time to raise the water to the boiling point as the spirit lamp.

The details are extremely simple and can be carried out in any ship.

Materials required: (i) A block of wood 8½ in. × 3 in. × 2½ in. (ii) three

[illegible] layers of [illegible] radiator element [illegible] No. of radiator [illegible] of flexible [illegible] No. 726 [illegible]

The [illegible] of the wooden [illegible] the [illegible]

The [illegible] asbestos [illegible] with wool. At [illegible] through this [illegible] the [illegible] to [illegible] the [illegible] the [illegible] of the [illegible]

[illegible] FROM [illegible] BRUSHES

[illegible]

[illegible]

fig. 1

[illegible] the face. The lesion was [illegible] the lower jaw. It consisted of a [illegible] of the [illegible] the [illegible] of the [illegible] matter was evidenced with [illegible]

[illegible] seen and the patient was [illegible] out to hospital.

On admission [illegible] 1911. [illegible] There was [illegible] especially no pain or tenderness [illegible] mass was not [illegible] and in the centre [illegible] wound [illegible] vesicular [illegible] typical of a [illegible] on the [illegible] portion [illegible] well marked the [illegible] glands [illegible] The bacteriological [illegible] vestibule [illegible] of anthrax bacilli [illegible] coiled Gram [illegible] small chains. No [illegible] the material [illegible] were made and [illegible] pig inoculated. The culture [illegible] and staphylococci [illegible] which the [illegible]

[illegible]

was easily [illegible] cultured [illegible] Well marked [illegible] The [illegible] hours after inoculation [illegible] the post [illegible] the blood [illegible] all teeming [illegible] there was not the [illegible] the bacilli.

Treatment. Supplies [illegible] to obtain some Schmitz [illegible] were fortunate [illegible] to treat one case. The [illegible] from the Colonial [illegible] the serum obtained was [illegible] old. If [illegible] therefore [illegible] defibrinated strength [illegible] rather [illegible] were made [illegible] places into the abdominal [illegible]

December [illegible]	50 c.c.
December [illegible]	10
December [illegible]	30
	120 c.c.

The [illegible]

In two [illegible] few days. [illegible]

The [illegible] local treatment [illegible] antiseptic [illegible] possibility the [illegible] cured the [illegible] entirely, but [illegible] thought advisable [illegible] the mould [illegible]

The patient who was [illegible] only accidentally [illegible] about November [illegible] 1921 he had purchased a new [illegible] He [illegible] at once. Despite the numerous [illegible] he had taken no steps to have it disinfected.

The [illegible] of brushes in question had been [illegible] but had only recently been opened for sale. Several of these [illegible] and although there was no conspicuous growth [illegible] isolated from guinea-pigs [illegible] that [illegible] with the [illegible] Unfortunately the brush used by the patient had been [illegible] when the nature of the [illegible] was suspected.

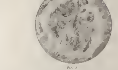


Fig. 3

With regard to the disinfection of brushes, it has recently been stated that it is impossible to completely sterilize a brush once it has been manufactured, and that the only real safeguard is that the hair to be used should be sterilized before it is assembled.

If only one lesson is to be learnt from the above case it is that a stock of Sclavo's serum should always be kept at the various depots and in flagships or isolated units. We have proof that it remains active for a very long time and the expense incurred would be justified if only one case should arise once in a while.

Hewlett states that Sclavo's anti-serum is made by first immunizing asses with a vaccine and then inoculating them with increasing doses of virulent cultures over a prolonged period. Out of 163 cases Sclavo had only ten deaths, about one

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*[Since this account was sent in for publication information has been received that the [illegible] brush was purchased locally in Shanghai.—Editor.]

fourth of the usual mortality from anthrax in Italy and it is quite possible that had the cases been diagnosed earlier he would have had an even less mortality. Imagine what a catastrophe it would be if a fatal case should occur in the Navy and the patient not have the benefit of this serum.

The accompanying photographs, which were taken by Sick Berth Petty Officer H. Tothill, show —

(1) The anthrax bacilli in the material from the pustule.

(2) The bacilli in the minute blood of the inoculated guinea pig.

(3) The bacilli swarming in one of the guinea pig's glomeruli.

I am indebted to Surgeon Captain Dalton, C.M.G., R.N., for permission to publish this case, and to Surgeon Lieutenant Commander Hayes, R.N., and Sick Berth Petty Officer H. Tothill, for administrations.

VERBATIM REPORT OF AN INTERESTING CASE OF INJURY OF CERVICAL VERTEBRÆ. *(COPIED FROM OLD RECORDS OF THE ROYAL HOSPITAL, HASLAR.)*

CONTRIBUTED BY SURGEON LIEUTENANT COMMANDER L. MOXON BROWNE, R.N.

H. L., boy, 2nd Class, aged 17, H.M.S. "Hope," January 9, 1869.

This boy received a severe fall while diurnal on shore at St. Helena, striking the left shoulder and side of the knee, although he suffered from difficulty in swallowing, which has since become spasmodic. His strength has become considerably reduced from his inability to swallow solids, and partial inability to swallow liquids for a considerable period. I beg to recommend his case as a fit case for hospital treatment.

(Signed) H. A. Bruce,
Asst. Surg.

January 1. Received into hospital. He appears to have injured the spine by the fall; there is a certain rigidity of the muscles of the neck; pain in the head is moved from side to side with a good deal of pain; also in the extremities. Pain in the occiput to the 6th cervical vertebra. Has a miserable, weak and debilitated state. To take liq. ergotini, bad. 4 drm.

10th. Bowels confined; an enema was applied to the back of the neck and over the principal seat of pain.

11th. Is a good deal relieved. He has passed a good night; pain in the head from the seton, bowels confined. Ol. ricini, 1 oz.

12th. Complains of great pain. Tongue furred; pulse small and normal.

13th. Spinal process of bone, which appears to be evidently [illegible] spongy structure of the body of vertebra, [illegible] irritation about the 6th cervical vertebra, and the [illegible] about a fortnight after the accident. He must be [illegible] before. Mr. Phillips of Antia. Complains of severe pain in the back, shoulders and shoulder. Tongue furred, pulse [illegible].

14th. Complains still of pain. Opiate [illegible] side of back and shoulder. Bowels confined. Enema [illegible].

15th. Feels less pain.

16th. Allowed to sit up in bed. Mist. [illegible] and tea.

17th. Has slight redness over the trochanter [illegible]. The hip to be rubbed with liq. saponis et tinct. [illegible] and cotton wadding applied over all.

18th. Feels pretty well to-day; bowels are confined. Ol. ricini. Diet as before.

19th [illegible] These [illegible]

20th [illegible]

21st Was very [illegible] the anodyne to be [illegible]

22nd [illegible]

23rd [illegible] of sense of [illegible] he now takes [illegible] [illegible]

28th [illegible] [illegible] [illegible] He is [illegible] greatest care [illegible]

29th [illegible] perfectly [illegible]

31st Says he feels [illegible] his throat [illegible] control [illegible]

February [illegible] At the [illegible] [illegible] [illegible]

[illegible] constipated [illegible]

[illegible] going on well [illegible]

11th He [illegible] to sit up for two or three [illegible]

[illegible]

[illegible]

26th [illegible] He is now gaining in strength [illegible]

March [illegible] his strength and wait for [illegible]

He [illegible] did [illegible] home

He was accordingly [illegible] on March [illegible] to H.M.S. [illegible] for passage to England.

This was a very remarkable and interesting case. Either the [illegible] actually broke his neck when he fell or injured the [illegible] so [illegible] as to induce caries or ulceration of the bone; yet as it appears that portions of the bone were spat up a long [illegible] after the accident, it is more likely to have been fracture, the broken pieces ulcerating through the pharynx into the mouth.

(Signed) J. D. [illegible] M.D.
Surgeon

* * *

Reviews.

THE PRACTICE [illegible] IN THE TROPICS [illegible] W. Byam [illegible] Medical Publications [illegible] 1921 Pp. [illegible]

Volume [illegible] of excellence of [illegible] This volume [illegible] of [illegible] medical [illegible] consists of the [illegible] of interest [illegible] Sir Percy [illegible] in its [illegible] feature of the [illegible] and [illegible] treated [illegible] parasites [illegible] the [illegible] of the [illegible] hookworm [illegible] these [illegible] special [illegible] and [illegible]

[illegible] Medical [illegible] Orthopædic [illegible] Visiting Surgeon [illegible] Ministry [illegible] Queen Mary's [illegible] Rodman & [illegible] Fleetwood [illegible] 1922 Pp. vi + 81 [illegible] profusely illustrated with drawings and photographs. Price 18s. net.

This book is in the press, it is the only one dealing solely with [illegible] artificial limbs and the stumps to which mechanical appliances [illegible] The usefulness of such a work has always been evident but war [illegible] rendered the necessity for one urgent and allowed single [illegible] sufficient experience to be able to make author itative statements. [illegible] himself remarks on p. 42. "Amputations before the [illegible] were regarded as uninteresting." The demand for artificial limbs [illegible] and it was difficult to find the experience required to select the [illegible] prosthetic appliance. The experience of Mr. Muirhead Little is [illegible] than that of any other living surgeon and it is fortunate for either [illegible] the profession that he has seen fit to compress the result of his observations in this book.

Mr. Little opens with an historical chapter which is exceedingly interesting as showing that as far back as 1509 an artificial hand had been manufactured not exceeded in complexity of movement and mechanism by those of the most renowned makers of to-day.

The chapter on Artificial Stumps is probably the one of most value to the naval surgeon, as apparently the chance of a useful mechanical appliance being

fitted [illegible] on the operation [illegible] and in the days [illegible] the [illegible] the [illegible] Now [illegible] who has [illegible] his pit[illegible] [illegible] stump cannot read h[illegible] [illegible] ch useful [illegible] thoroughly

The [illegible] other procedures [illegible] the utility of stumps [illegible] this [illegible] by Bonnet [illegible] that they [illegible] of the [illegible] causes and [illegible] have [illegible]

[illegible] with the various types [illegible] ly charyl [illegible] [illegible] the [illegible] experience the patient [illegible] and for general purposes to last back [illegible] life It should be mentioned that eating [illegible] risks to the patient's mouth and is [illegible]

[illegible] is also adequately dealt with and the [illegible] to be much more satisfactory

[illegible] the library of every operating surgeon and [illegible] it is of inestimable value

J R M

[illegible] Series of Lectures delivered at the [illegible] April 1913 By Sir William [illegible] Medical University Press London [illegible] Pp xv + 243 107 [illegible]

[illegible] Hopkins annual course of lectures was [illegible] the object of illustrating the presence [illegible] manifested on the natural [illegible] ly [illegible] from the domains of [illegible] to astronomy chemistry [illegible] Other lectures were delivered [illegible] the work has [illegible] committee including Dr Fielding [illegible] Washington the medical historian [illegible] Egypt Sir [illegible] and Babylonian Hebrew [illegible] which highly intel [illegible] restricted by [illegible] which still holds the [illegible] universal antinomy all [illegible] Lady Japanese [illegible] began in the [illegible] in 1868 Japan has made [illegible] The [illegible] to Greek [illegible] and con [illegible] the rival of Nature [illegible] Hippocrates and Aristotle [illegible] medical thought in fifteen [illegible] began to question the [illegible] medieval medium deals with [illegible] the rise of the universities [illegible] of anatomy and physiology

the influence of Galen, Celsus, Paracelsus, Vesalius, Leonardo da Vinci and Harvey is explained. The seventeenth century saw the rise and development of modern medicine for Malgaigne taught us to think clinically. Sydenham following in the footsteps of Hippocrates took as his text Nature at a time when the mania of Hypothesis was at its height and towards the end of the century many great clinical teachers arose, of whom Boerhaave, often called the Dutch Hippocrates, was perhaps the most famous. The work of Colles, Jenner, John Hunter, Laennec, Pasteur and Koch are briefly summarized and the last chapter deals with preventive medicine.

In conclusion no medical man can fail to be interested in this attractive monograph which is beautifully printed and very generously illustrated by interesting portraits and title pages of the most famous medical works.

H. D. R.

A Study of Intestinal Stasis. By J. C. Watt, M.C., M.B., Ch.B., West African Medical Staff. London: John Bale, Sons and Danielsson, Ltd. Price 1s. net.

This thesis, which is published in the form of a pamphlet, expounds the author's views with regard to the causes of intestinal stasis and describes an operation suggested for its treatment in this disease.

The author's statements are confirmatory of what Sir Arbuthnot Lane has taught for many years, but he has shown, while fact that as whatever point may find stasis in the whole alimentary system, the cause must be sought at a lower level. He suggests that the pelvic colon is the seat of the stasis and describes a surgical operation to deal with the hindrance at the pelvicecal junction which is the primary cause of it.

The author has published his thoughts, as he considers that the observations and clinical experiments detailed are sufficient to justify the examination of the whole thesis by the medical profession, but as unfortunately he has not had the opportunity of performing the proposed operation and proving his theories.

The Intensive Treatment of Syphilis, with Locomotor Ataxia in Various Methods, with Notes on Salvarsan. By Reginald Hayes, M.B.C.S., late Lorch Fellow, Guy's Hospital. London: Baillière, Tindall and Cox. 1922. Pp. viii + 99, with 1 plate. Price 4s. 6d. net.

The second edition of this small work has appeared in the Journal for October 1917, and the third edition in the January number 1920. The book has been written, and the author proposes that numerous patients, better results than by other methods of administering the drug, the author has with strength the intravenous injection of neosalvarsan and mercury, and to which is added a number of valuable and worthy medical practitioners.

By Medical methods the author means the intramuscular injection of 0·3 gm. of neosalvarsan and mercury by the intramuscular method, under medical supervision, which has been found to be the most effective and administered at Aldershot. The risk of the drug has not been so great as in the intravenous method, and the author has found it safe to administer it to all patients, even those with heart disease. He describes the Aldershot method in detail, and the results of the treatment carried out by this method are given. The author concludes by giving the methods of taking, with point of the lock, and the treatment of illustration.

This monograph is well worth the careful consideration of all those who are interested in the treatment of syphilis. The results of intramuscular injections of the neosalvarsan and mercury are satisfactory, and in these cases the Aldershot method is reported to be specially applicable. The results obtained in the cases described in this book are highly satisfactory.

THE [illegible] the [illegible] Right [illegible] Bale [illegible]

In the [illegible] brains and [illegible] The [illegible] own special [illegible] not weight [illegible] for special [illegible] include Insanity [illegible] families of the N[illegible] Neuralgia [illegible] Deformities of the [illegible] Lecturers [illegible] W[illegible] Savage Rill[illegible] Medical [illegible] The subj[illegible] text book style [illegible] results [illegible] and research

Sir Clifford Allb[illegible] his own [illegible] the [illegible] apparently [illegible] the energetic [illegible] Medicine [illegible]

W[illegible] of similar vol[illegible] the [illegible]

[illegible] Mullo[illegible]

[illegible] know [illegible] though [illegible] tiles of [illegible] characters in [illegible]

THE [illegible] of a [illegible] by Dr. William Brown [illegible] Mental [illegible] University of Oxford and Author [illegible]

[illegible] of modern methods on mind are [illegible] M. Coue's views indicating their [illegible] theories of Psycho-analysis

◆

Notice.

[illegible] NURSING SERVICES [illegible]

[illegible]

[illegible]

[

News of the Service.

HONOURS AWARDED

[illegible]

AWARDS OF SIR GILBERT BLANE'S GOLD MEDALS

[illegible]

THE PARKES MEMORIAL PRIZE

[illegible]

DEGREES AND DIPLOMAS

[illegible] Commander James G. Dawson obtained the M[illegible] [illegible] 1922.

[illegible] Charles H. Dyer was successful in [illegible] the London Competitive Colleges as the result [illegible]

[illegible] Maurice S. Moore M.B., B.A., [illegible] M.D. of the University of Cambridge [illegible]

COURSE OF STUDY FOR PROMOTION TO RANK OF SURGEON COMMANDER

The [illegible] course of study for promotion to the Naval Medical Officers [illegible] from October 1, 1921, to [illegible] 1922.

As will be known by [illegible] examination [illegible] promotion [illegible] Surgeon Commander [illegible]

The examination was [illegible]

Part I.—This consists of Medicine and Naval Medicine, Surgery and Operative Surgery, Dermatology and Venereal Diseases, Pathology and Bacteriology and Anatomy.

The part of the course which will be in [illegible] examination [illegible] Chemistry in Dermatology and Anatomy [illegible]

Instruction in the other subjects was carried out [illegible] including [illegible] of operations [illegible] adults, [illegible] Bacteriology [illegible]

[illegible] Greenwich [illegible] 1922 [illegible]

Part II.—This [illegible] following [illegible] Lieutenant Commander [illegible] Commander [illegible]

Surgeon [illegible] promotion [illegible] Director General [illegible] Surgeon [illegible]

PROMOTIONS.

Surgeon [illegible] George F. Hall promoted to Surgeon [illegible] March 21, 1922.

Surgeon Lieutenant [illegible] H. Kelly, M.B., promoted to Surgeon [illegible] March 1, 1922.

Surgeon Lieutenant-Commander Henry St. C. Colmer, M.B., promoted to Surgeon Commander in April, 1922.

Surgeon Lieutenant-Commander [illegible] R. Stephens, O.B.E., M.B., [illegible] Chief P.O. Sick Berth Steward Arthur H. Jones, M.B.E., [illegible] Abraham S. Pelosi, M.B., [illegible] N. W. W. Hodges, B.A., [illegible] M.B., promoted to Surgeon Lieutenant-Commander, [illegible] March, 1922.

Surgeon Lieutenant John W. Nash, promoted to Surgeon [illegible] May 15, 1922.

ROYAL NAVY MEDICAL CLUB

[illegible] held on Thursday, April [illegible], at 8 p.m., at the [illegible] [illegible] enjoyable evening was spent [illegible] Sir Robert Hill, K.C.B., K.C.M.G., C.B., C.V.O. [illegible] and the principal guests of the evening were [illegible] K.C.M.G., K.C.V.O. (*[illegible] of the Royal College* [illegible]) [illegible] M.B., F.R.C.S. (*Dean of the [illegible]*) [illegible]

[illegible] representative of the Medical Service [illegible] [illegible] serving and retired Officers [illegible] [illegible] the [illegible] was well attended [illegible]

[illegible]

[illegible]

ROYAL NAVAL MEDICAL COMPASSIONATE FUND

At the Quarterly Meeting of the Directors of the Fund held on April 11, six cases were considered and £90 voted to the applicants. The following is a summary of the cases relieved:—

Daughter, aged 77, of surgeon in Royal Navy, who died in 1869. Is unable on account of age to do any work, and has relatives unable to [illegible]. Receives a grant from the Naval Compassionate Fund. Voted £15.

Daughter, aged 19, of [illegible] surgeon in Royal Navy, who died in 1868. Applied [illegible] on the ground that, owing to ill health, her earnings at present are very small. Was [illegible] relieved [illegible] application. [illegible] (£10 [illegible]). Voted [illegible].

Daughter, aged 71, of surgeon in Royal Navy, who died in [illegible], in poor circumstances. Is in receipt of grants from [illegible] the Naval Compassionate Fund. Voted £20.

Daughter, aged 40, of a deputy inspector-general in Royal Navy, who died in 1899. [illegible] due to overwork (attested by medical certificate). Voted £15.

Daughter, aged 46, of a fleet surgeon in Royal Navy, who died in 1889. [illegible] 1917 has been [illegible] affected [illegible] shock [illegible] being torpedoed [illegible] amounting to £40. Applied for [illegible]. Voted £20.

Daughter, aged [illegible], of deputy [illegible]. Scotch pension of £20 [illegible] (attested by medical certificate). Voted £20.

Medical Officers on the Active List of the Royal Navy [illegible] Honorary Secretary, Royal Naval Medical Compassionate Fund, [illegible] Admiralty, S.W. 1.

ADMIRALTY ORDERS ISSUED FROM MARCH 15, 1922, TO JUNE 15, 1922

(Only the more important Orders pertaining directly to the duties of the Medical Officer [illegible] are included.)

1226.—Dentures—Supply and Replacement, &c.

(N. [illegible]/21.—[illegible] 1922.)

Applications for the supply or replacement, &c., of dentures [illegible] M.O. [illegible] are to be [illegible] to the Medical Director-General, Admiralty, Form M. [illegible] [illegible] Medical Officer [illegible] to be effected at Crown expense without the [illegible].

(2) [illegible] may [illegible] supply of dentures at the public expense [illegible] in the Service [illegible] the damage was [illegible] by [illegible] Senior Medical Officer [illegible].

(3) [illegible] would be delayed [illegible] should be [illegible].

[illegible] to prevent [illegible] that at the [illegible]

TEMPORARY MEDICAL OFFICERS—RETENTION OF RANK, ETC

The Board of Admiralty has decided that Medical Officers who were granted temporary commissions as Surgeon, Fleet Surgeon, Rear Admirals and Surgeon Captains during the war and whose commissions expired prior to November 11, 1918, are entitled to retain their rank and to wear the uniform of that rank on State and other occasions of ceremony, in the [illegible] Dress. The dressed and undressed uniforms of these officers are to be worn and be found on page 901 of the Quarterly Navy List.

Journal

of the

Royal Naval Medical Service.

Original Articles.

POINTS OF INTEREST RESPECTING RESISTANCE TO MORE EXTENSIVE TRAUMATISM TO THE [illegible]

By [illegible]

The subject of this paper is one that should [illegible] not only to the [illegible] of medical [illegible] but to all those who are directly interested in the health and well-being of people. My principal object is to [illegible] who have [illegible] second to [illegible] the desired [illegible] intimately connected with the subject of this [illegible]

The [illegible] and problems [illegible] immunities [illegible] Circumstances [illegible] the wear of the [illegible] generally present [illegible] preserving [illegible] article was limited [illegible] and Mercantile Marine. [illegible] In the first place [illegible]

[illegible] June 19[illegible]

[illegible] populations of the [illegible] the present time and the [illegible] due to the different [illegible] by themselves or [illegible] varying very much [illegible] present and away from the towns butcher [illegible] mutton was rarely used by the working [illegible] of the preservation of food it has been [illegible] even the poorest to purchase in a pro[illegible] the luxury of the rich adding greatly [illegible] placing at their command at all seasons [illegible] readily obtainable at a reasonable price [illegible] of their lives it has, in other [illegible] an important democratic factor in [illegible] the subject of considerable discussion [illegible] owing to the ease with which pre[illegible] tend to laziness or a life of [illegible] excellent [illegible] of the wives of even the [illegible] labourer [illegible] large extent relieved [illegible] Simi[illegible] the opinion that [illegible] health of the community has [illegible] sufficient May I [illegible] this suggestion—that living in the [illegible] within co[illegible] times by which preserved [illegible] frozen meat in [illegible] prices have been obtainable [illegible] tendency for [illegible] if the population in the [illegible] the [illegible] increasing the com[illegible] ting It seems to [illegible] have been practically impos[illegible] in the several individuals [illegible] and in [illegible] by their own efforts

[illegible] generally admitted that the physique and general [illegible] population of the country villages have always been [illegible] the town population, class contrasted in the great centres [illegible] of the physical predictions is considered it is a matter [illegible] that it has attracted so little attention from original [illegible] research even those whose duty it is to watch [illegible] which dangers may possibly arise affecting the [illegible] community From my long experience [illegible] variety of products in enormous quan[illegible] the [illegible] opinion that in the pre[illegible] taken in the factories of firms [illegible] in which in the course of [illegible] of serious illness arising [illegible] the products from faulty manufacture [illegible] that amid the enormous number of [illegible] in the work there is always

[illegible] employees [illegible] years ago [illegible] that [illegible] Switchbinder [illegible] essay in [illegible] manger [illegible] irresponsible employees have [illegible] old [illegible] and other substance in use in the [illegible] as a practical joke. I submit to you that [illegible] your [illegible] rather find or have your attention [illegible] in my [illegible] preserve the firm should not [illegible] more desirous than the [illegible] should immediately drawn to the matter.

[illegible] short period to review [illegible] from the time of the first [illegible] the early period [illegible] Napoleon was invading Europe with [illegible] armies and [illegible] of obtaining world domination but he [illegible] and after [illegible] that [illegible] British Empire was brought under [illegible] his [illegible] Be a failure. By his Berlin Decree [illegible] known as the Continental System he attempted a blockade of the [illegible] with a view to attacking British merchandise and [illegible] to [illegible] of shoe repairs. This [illegible] seriously [illegible] England but [illegible] his allies and [illegible] practically drawing their [illegible] point that this situation in this instance was [illegible] each other. The commercial [illegible] and naturally the [illegible] supplies were [illegible] that the [illegible] offered a prize of 12,000 francs to any [illegible] could [illegible] the preservation of food so that supplies could [illegible] preserved. In this instance as in many [illegible] the late war the [illegible] and in 1810 M. Appert was awarded the prize by the [illegible] Arts and Manufactures of Paris for his method of food preservation which [illegible] has formed the basis on which the world's [illegible] are more or less carried out.

May I [illegible] your attention to the fact that the [illegible] part of the [illegible] was almost an exact replica of that of the [illegible] World domination was the ambition of the [illegible] Emperor of Germany and as in the case of Napoleon the British Empire was [illegible] Commercial [illegible] prepared by the [illegible] submarines sent out in such numbers to Germany and the food supply. The world was again [illegible] This is a remarkable fact [illegible] the necessity for the discovery of a method of food preservation [illegible] and was successfully achieved and in the third fact that preserved foods [illegible] presented [illegible] directly [illegible] was [illegible]

[illegible] in keeping the [illegible] and rectly brought [illegible] to feel from [illegible] resources of [illegible]

[illegible] the discov[illegible] producem[illegible] given to M. Appert [illegible] that in [illegible] Society of Arts awarded [illegible] Saddington [illegible] preserving fruits without [illegible] stories [illegible] was practically identical with [illegible] Appert [illegible] Scientific [illegible] discovery nevertheless [illegible] [illegible] the [illegible] present for [illegible] 1824 [illegible] prize list [illegible] Dakin, [illegible] named [illegible] the [illegible] of the [illegible] publication [illegible] to [illegible] applied [illegible] the [illegible] 1851 [illegible]

[illegible] M. [illegible] H. M. [illegible] M. [illegible]

[illegible] ceased in 1871 [illegible] and [illegible] made in the open market of meat [illegible] Zealand or North and South America. [illegible] did not commence until 1877. These [illegible] Australian brands have always [illegible] implants have come to hand. It is [illegible] detail the various preserved foods [illegible] is practically a complete list —

[illegible] milk, jams of various descriptions [illegible] fruits, including such articles as [illegible] extract soup, clear chicken [illegible] brands in variety for submarines [illegible] marmes, bacon for submarines [illegible] potts pots) meat and vegetable [illegible] cautions salt pork in casks. [illegible] is contained in casks and the [illegible] this, and in nearly every case [illegible] this being the means which [illegible] made of the tinned [illegible] and [illegible] their keeping qualities upon [illegible] amount of sugar and [illegible] loss [illegible] large extent [illegible] is the Naval Service is [illegible] in the tin which pro[illegible] The agent is the preserving agent [illegible] for a long period [illegible] while the animals are in a very [illegible] the [illegible] of this product [illegible] jam should then not as [illegible] brown [illegible] proceeds [illegible] and protected [illegible] this product when [illegible] free [illegible] plan the column [illegible] becomes [illegible] preservative [illegible] small quantity of [illegible] must be limited [illegible] though [illegible] in other [illegible]

[illegible] oils can be [illegible]

(1) Sterilization;
(2) Desiccation.

There are several articles [illegible] fleet in which [illegible] relied upon for their preservation [illegible] the limits of [illegible] permit of this matter being dealt with [illegible] regard to the [illegible] which means substantially that the products must [illegible] long enough to stand the [illegible] Service—(almost perfect samples [illegible] now obtainable in *bottles* properly [illegible] difficulties which beset the [illegible] responsible for the maintenance [illegible] keep in view, of these the following are [illegible]

(1) *Freedom from Metallic [illegible] and its [illegible]*

The maximum amount of [illegible] food product likely to be consumed by [illegible] grams of tin per pound. It may be [illegible] products which give great trouble [illegible] milk produced both in this country and [illegible] badly etched, and have a dull grey [illegible] might naturally cause suspicion [illegible] a casual examination, as it is clear [illegible] brighter appearance is more largely contributed [illegible] considerable trouble and its actual [illegible] forward is that if the tin be deposited on the [illegible] it is more likely to be affected than if it were [illegible] there are practical difficulties in the way [illegible] dition is always of trained. It would also [illegible] of the tins before filling and the hydrogen [illegible] milk are other factors of great importance. [illegible] carrots, tomatoes and onions among vegetables [illegible] particularly among fruits have a very [illegible] surfaces. During the past fifteen years experiment [illegible] the object of overcoming this serious defect by [illegible] especially prepared lacquer consisting mainly of [illegible] baking the treated sheets in ovens [illegible] have been remarkable and numerous preserves such as [illegible] raspberries and jams of all descriptions are now put up [illegible] fully by the adoption of this comparatively simple [illegible] bon to emphasize that in this field of progress there is [illegible] on the part of this Institute as in my opinion no limits which [illegible] apple peaches or any other description should be permitted [illegible] unless this simple expedient has been resorted to. [illegible]

[illegible]

[illegible] *Wat* [illegible]

[illegible]

[illegible]

[

[illegible] pressure [illegible] in boiling water for from [illegible] from the retorts the tins are placed [illegible] The [illegible] and the contents then assume the [illegible] [illegible] canned [illegible] and [illegible]

It is prepared from the same class of meat as the corned [illegible] pickled but is cooked in boiling water for half an hour [illegible] minutes is more usual in U S A) and afterwards put [illegible] are kept in retorts for [illegible] or three hours under a pressure [illegible] The initial parboiling process is primarily done to induce [illegible] it and thus reduce the [illegible] of the contents prior to intr[illegible] [illegible] If the raw or even put straight into the tin and [illegible] the tin would be found to be only about two-thirds full [illegible] and the balance gravy or soft jelly The question [illegible] primarily depends upon the meat used and the amount [illegible] the course of manufacture It is interesting to [illegible] extract from Liebig's Researches on the Chemistry [illegible] I think he kept in view by all those responsible for the [illegible] committed to their charge It is obvious that [illegible] is again to become flesh in the body—if it is to [illegible] itself in its original condition—none of the [illegible] with drawn from it during its [illegible] It is important to be altered in any way—if one of the [illegible] essentially to its constitution be removed—[illegible] place in the power of that piece of [illegible] by the original [illegible] and quality on which [illegible] living organism depend It follows from this that [illegible] without the soup formed in boiling it, is so much [illegible] for nutrition the greater the quantity of the water in [illegible] and the longer the duration of the boiling

Corned Beef—The best qualities usually stocked are obtained [illegible] lean meat should be in moderately sized flat pieces [illegible] with hard fat of which there should be not less [illegible] than 20 per cent and there should be no [illegible] The fine skin and skirt should be entirely absent [illegible] in inferior qualities It will be found that [illegible] is decidedly [illegible] the reason for this is [illegible] part in the fresh state whilst lean meat is [illegible] preserved meat a better appearance This latter [illegible] matter of opinion I would point out that the [illegible] the Naval specification has always been [illegible] only in every tin as that would be practically [illegible] by a large bulk supply This was due to [illegible] fat tends to keep the lean portion in a moist [illegible] is all drawn (acts as a lubricant in other words) [illegible] extracted from well fed animals and that the

[illegible] municipalities [illegible] lunary [illegible] products are sold in small quantities only [illegible] of fat renders the meat unsightly and [illegible] particularly in hot weather but it should be [illegible] for the meat to be kept cool either in refrigerators or by some [illegible] I would recall the marked deterioration of the health of the population of Austria and Germany during the war which was largely consumed being almost entirely denuded of its fat which was required for the purpose of the manufacture of glycerine. The meat should be canned in as large pieces as possible. Canned beef of the quality contains meat from principally shins and hind quarters [illegible] the diaphragm and neck. A good quality meat is [illegible] by the process adopted in manufacture. The pellicle [illegible] can be varied to such a degree as to make [illegible] finished article both as regards appearance and [illegible]

Lipeumia.—Unless the amount of saltpetre is [illegible] instead of getting a nice uniform red appearance the [illegible] appear either of an unpleasant dark and sloughy [illegible] (dell of blood) by the amount of saltpetre [illegible] pieces of lean will have a green or [illegible] has been used. The latter appearance [illegible] meat not being left in the pickle long enough [illegible] ness and intensity of the red [illegible] will be a measure of the deficiency in [illegible] time weakness of saltpetre or brine. The [illegible] to oxyhæmoglobin and on cooking [illegible] this body is split into hæmatin and globin [illegible] hæmin. The presence of potassium nitrate [illegible] nitrohæmoglobin NO or a reduction product [illegible] The natural jelly resulting, but in the meat [illegible] fairly soft clear and of a bright amber [illegible] is imbedded in a hard jelly of a [illegible] meat. When excessively hot [illegible] is used for filling up—also much fat is [illegible] is objectionable as fat naturally sets [illegible] likely to get thrown away as [illegible] fat naturally presents which has [illegible] thrown large solid lumps of soft fat [illegible] objectionable. [illegible] tin [illegible] opinion in hot weather the [illegible] aspect as liquid fat will be running [illegible] the meat. On [illegible] must not however [illegible] overlooked [illegible] that if the meat [illegible]

[illegible]

[illegible]

[illegible]

posit[illegible] as given by the U S A Department of Agriculture [illegible] [illegible]

			Protein N × 6 25	Glycogen	Meat bases	Ash	Salt
Average	[illegible]	11 [illegible]	26 63	0 [illegible]	1 11	4 19	3 37
Maximum	[illegible]	1 [illegible]	30 56	0 12	1 17	7 38	1 68
Minimum	[illegible]	8 [illegible]	23 [illegible]	0 11	0 62	3 57	2 [illegible]

[illegible] present is of course closely associated with [illegible]

[illegible] *fresh beef* were also obtained from the [illegible]

Average	[illegible]	[illegible]	35 [illegible]	0 [illegible]	1 58	1 28	0 13
Maximum	[illegible]	[illegible]	34 44	11 7	3 21	3 51	[illegible]
Minimum	[illegible]	[illegible]	30 65	0 36	0 [illegible]	1 61	0 01

[illegible] purpose the figures for *fresh beef* were also given

Average	[illegible] 19	1 10	18 89		1 28	0 96	0 08
Maximum	1 17	1 33	11 14		1 65	1 13	0 24
Minimum	[illegible] 81	1 81	10 61		1 13	0 75	Trace

From what has already been said it will be evident that the process of [illegible] and boiling of the raw meat so that [illegible] meat [illegible] form. On the other hand it may be taken that 3 [illegible] canned beef are equivalent to 1 lb of fresh meat. It will also be [illegible] from the foregoing tables that corned beef contains relatively less [illegible] correspondingly more proteins than boiled beef. This is largely due to the longer boiling to which the corned beef is subjected [illegible] on the other hand the long time the corned beef is submerged in pickle and the more lengthy period of boiling before canning [illegible] the amount of soluble meat bases and glycogen (animal starch) present compared with those in boiled beef. This is exemplified in the following figures:—

	Boiled beef	Corned beef
Maximum	0 62 to 3 21 per cent	0 62 to 1 17 per cent
Average	0 [illegible] 70	0 11 0 12

[illegible] (during pickling process) is largely responsible for this as [illegible] by the fact that Polimatis found that 7 [illegible] per cent of the phosphoric acid [illegible] per cent of the phosphoric acid were extracted by the pickle solution in the meat curing. The meat bases included in [illegible] by multiplying the sum of N found [illegible] proteins purposes and gelatin by 5 12.

[illegible] the [illegible] of the description of condensed milk [illegible] the Navy Service and I believe the Army Service is that [illegible] quantity of this exported to America. The [illegible] condensed milks with a large [illegible] condensed

without sugar. It may be [illegible] to note that condensed milk as consumed to-day was first discovered and manufactured by Mr. Gail Borden of Montreal in 1857, and the Borden Company of Montreal still flourishes. The various condensed milk companies throughout the world have all been formed since that period. Evaporated or unsweetened milk is not used to a large extent by the civil community, the greater quantity being produced for and consumed by the Naval and Military Forces. Just recently there has been a blooming of the evaporated description for general use, but the sales have not been large. The reason why the sweetened condensed milk, which I may say here is produced by the men cannot be supplied as a ration is the fact that it will not keep for more than a few months in a perfectly serviceable condition under all the conditions existing in the Naval Service. It is liable to become very thick resembling soft cheese very dark in colour and almost insoluble even in boiling water. This change is no doubt due (1) to the fact that the milk is not sterile and (2) to the large percentage of sugar it contains (40 per cent.) which, although it acts as a preservative, may lead to gradual caramelization, thus by causing the milk to assume the dark brown colour referred to. When the two descriptions are opened in use the unsweetened variety keeps much better and longer than the unsweetened, this being of course due to the sugar and to the fact the sugar crystallises forming a crust on the top of the milk which resists the action of the air [illegible] exactly as jam does. The production of sweetened milk is a very simple process provided every care be taken that the raw milk is in good condition and the whole of the machinery and appliances used in its manufacture are kept scrupulously clean. All factors surrounding the production of this article must of necessity be kept in good condition and I venture to express opinion from my experience of fifteen years extending now over a long period of years that the product is handled with more care or produced under such favourable conditions. The production of unsweetened milk requires the best technical skill and when perfectly produced will keep [illegible] under almost any conditions for a period. [illegible] as distinct from the sweetened variety [illegible] evaporated in condensed to practically two-fifths [illegible] the transition filling and [illegible] it is here that most of the trouble [illegible] I mentioned that the evaporation takes place until the raw milk [illegible] practically to two-fifths of its original bulk, this is [illegible] for supplies to the Naval Service and the following [illegible] as follows:—

Water	[illegible]
Fat	[illegible]
Milk sugar and albuminoids	[illegible]
Mineral substance ash	[illegible]

[illegible] milk [illegible] greater the danger of [illegible] this would ultimately [illegible] of the milk causing [illegible] obvious to you all that it [illegible] encourage that the milk [illegible] able to do so. In my [illegible] of the concentration [illegible] stated upon the tins [illegible] quality of the product [illegible] general considera[illegible] standards of [illegible] for sale in this [illegible] of opinion that the [illegible] very largely [illegible]

[illegible]

[illegible]

I [illegible] diffident [illegible] quality and in the smaller cities [illegible] the monotony of a dietary which is necessarily of an abnormal type though satisfactory dietetically and all those directly or indirectly interested in their supply are keenly alive to the highest efficiency

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THE WASSERMANN REACTION IN PRACTICE

By Surgeon Commander [illegible] HITCH M B R N

In view of the immense literary output mostly of a highly technical nature on the subject of the Wassermann reaction with which even those engaged in purely serological work can hardly cope it would seem unnecessary and indeed presumptuous on my part to put forward my further observations on this fascinating phenomenon but having been engaged for a considerable time in the treatment of cases of syphilis and in performing the laboratory work in connection with them I wish to call attention in this short article not to the technical or scientific side of the question but to the purely practical one from the point of view of the medical officer who is directly concerned in the treatment of syphilis and who at the present time relies so much perhaps even too much on the results he receives from the serologist for aid in prognosis diagnosis and treatment As a system of philosophy pragmatism may be regarded as dead but I propose to consider the truth of the Wassermann reaction from the pragmatical point of view If a patient has a positive Wassermann reaction, *what difference does it make to him?*

All naval medical officers are in various degrees syphilologists or should be so and most bluejackets consider themselves quite as competent to estimate the value of a blood test as their doctor This attitude on the part of the men appears to be due in no small extent to the popularization of pseudo knowledge concerning syphilis by the propaganda of the various bodies presumably engaged when not devoting their energies to interneciae conflict in the prevention or combating of venereal disease

A medical officer should therefore be able not solely to quote the laboratory report of a test to the patient but to interpret its meaning fully and advise or withhold treatment accordingly Apropos of this the following incident appears to possess a certain significance A rating

Leading Stoker I think suffering from "Syphilis Later Record" (as the official nomenclature hath it) with no active signs of disease was recently admitted to one of my wards. While his somewhat involved medical history was being elucidated he volunteered the statement that he desired mercurial treatment as the medical officer of his ship in whom he had complete confidence had told him that he ought to have a two years course of mercury. I demurred to this and in endeavouring to explain the divergence of opinions, quoted "Who shall decide when doctors disagree?" He unexpectedly replied without a moment's hesitation, "the patient." Perhaps after all he was right!

Now, if one resolves to read up the Wassermann test and put oneself thoroughly *au fait* with the subject one finds oneself confronted with no light task; one soon becomes involved in seemingly endless discussions about "mid-piece" and "end-piece" of complement—if indeed there *is* such a substance and if it is not merely a chemico physical state of fresh serum—about the "mysterious" Wassermann substance—if there is such a substance or combination of substances—about "false positives"—heterologous antigens—the relative advantages or disadvantages of "hot" and "cold" fixation and, finally, one is bewildered by the complexities of modern bio chemical nomenclature.

One then sends a specimen of blood to a laboratory for a test and on receiving the cryptic result, "negative hot positive cold" becomes lost in wonder and gives it up.

Let us then first consider what the practising physician ought to know about the test upon which he is asked to place so much reliance. He should certainly apprehend the theory of deviation of complement and the hypothesis upon which the original reaction was founded, but I do not think he need proceed farther; for if he does he will find no ultimate final conception which will appear completely satisfactory or which will be of practical use to him. He has no need to trouble about questions of laboratory technique, but he ought to know something about the methods of the scientist upon whose results he depends, and if he desires a Wassermann test ought not to be happy till he gets it. By this I mean that he should make sure that an original Wassermann test is performed, that he obtains a test which apart from minor details in technique retains the essential principles of the original test. These as enumerated by four distinguished pathologists[1] are as follows:—

1. The ingredients of the test (red corpuscles, antigen, hæmolytic system, and complement) are derived from *different* sources.

2. The serum to be tested is inactivated before use. An independent hæmolytic system is employed consisting of a suspension of red

[1] Wassermann, Bruck, Bauer, and Citron.

[2] "Special Memorandum upon Standardization of Pathologic Methods of Medical Research," Medical Research Council, Special Report Series, No. 1, 1918.

corpuscles [illegible] inactivated hæmolytic serum and a fresh normal serum containing complement The hæmolytic values of the inactivated serum and complement must be determined by a separate preliminary experiment

It is [illegible] fairly common practice to substitute various short-cut methods for the original test or even to substitute for it various tests relying upon the phenomenon of flocculation such as the Sachs Georgi reaction, or other physico-chemical tests such as those of [illegible] Hermann Porges or Porges Meier, and more recently the new Sachs test It is true that these are stated to agree with the real Wassermann test in a very high percentage of their results but their value is by no means universally accepted and the time has not yet come to discard the pre-war which has stood the test of years

The method which I suppose to be most used in the Royal Navy is that of MacIntosh and Fildes and, from experience of many thousands of tests I can vouch for its extreme usefulness The simplicity of technique the consistency of the readings and its great reliability especially commend it

A much more complicated method has recently been proposed as a standard[1] but it is not likely to be at all generally adopted at present and of it I have had no experience

It seems to me, that from the practical point of view the aim of research workers in attempting by various modifications in technique to increase the sensitiveness of the reaction, *i e* to detect as it is expressed the least trace of Wassermann substance, is misdirected Already false positives, that is positive results in a non specific sense are too large, and I think that an abnormally sensitive test tends to give results that may be misleading even to the elect Browning Dunlop and Kennaway have recently sounded a warning to this effect in an account of their work with unheated non-syphilitic sera which they found to react positively in certain conditions[2] I am quite sure that in the service again from the practical point of view, both medical officer and patient prefer to have a frank positive or negative result both as to diagnosis and treatment or test of cure

Let us now consider what exactly the Wassermann reaction claims to do, and what are its limitations First it claims to be the most universally employed biological test in the world and to be diagnostic of syphilitic infection apart from the presence of one or two well known well defined excluded conditions such as leprosy certain cases of earlier [illegible] &c Cases of malaria are often stated to give a positive Wassermann reaction and many workers have published conflicting results but the weight of the evidence is certainly against this opinion except perhaps in a few cases in which the blood is taken during the actual paroxysm My

[1] Griffith Scott and Eastwood Reports on Public Health and Medical Subjects No 1 Ministry of Health

[2] *Journal of Pathology and Bacteriology* January 1923

own experience goes to show that cases of malaria of [illegible] infection never give a frank positive reaction unless they are [illegible] syphilis. And it is frequently forgotten that a man may suffer from two diseases at once. But in point of fact, is a positive Wassermann result a proof of syphilitic infection? It is no *evident* proof: only the detection of the *spirochæta pallidum* itself constitutes such proof. Is it even a *certain* proof of syphilis that it does it certainly and infallibly indicate that living spirochætes are present in the patient's body although not necessarily in a state of activity?

The majority of authorities reply in the affirmative, *e.g.* Lilies and Parnell considered it a fact "that all who show a positive Wassermann reaction have active syphilitic lesions whether externally detectable or not." And numerous venereologists express themselves in much the same way but a study of the more recent literature indicates that the contrary opinion is beginning to be voiced by an increasing number of workers and is gaining ground. After all it is a fact that the *absolute* meaning of a positive result is not known and much recent work tends to show that the position of those who maintain that it is a sure indication of living specific infection is untenable.

In *Medical Science* of October 1921 will be found an excellent résumé of the work of certain American observers[1] who in an extremely interesting study found that doses of arsphenamine (i.e. salvarsan) which would produce fixed positive results in proved non-syphilitic patients and attribute this fact to the formation of a lipoidal substance (the Wassermann substance) from the tissues by the action of arsenic perhaps analogous to that produced by the action of *S. pallidum* and forming in the same way in the actual complement fixation test. These authors also state their agreement with Wile that "in the presence of intensive therapy a positive test does not necessarily mean living spirochætes and potential syphilis any more than a positive tuberculosis (? tuberculin) test in an individual who has had tuberculosis would indicate the presence of living tubercle bacilli. Exactly as a positive Widal the presence of living typhoid bacilli."

My own present opinion is that a positive test is completely diagnostic either of a present or past luetic infection and we have no laboratory methods of distinguishing between the two classes of cases. Take a case such as the following—a fairly typical one:—

A chief petty officer aged about 40 years, married twelve years, who has three or four healthy children and a wife also apparently healthy, had a chancre, as he euphemistically expresses it, when he was an A.B. about fourteen years ago. He has had no reminders since and thought himself perfectly healthy until either as the result of reading some of the

[1] An Analysis of Results of Wassermann Reactions &c. Med. Research Committee, January 1919.

[2] Strickler, Munson and Sellards: J. Inf. Dis. Jan. 1920.

broadly cast popular literature [illegible] of the dire effects of venereal disease or of hearing a medical [illegible] upon the bad disorder in a 'health lecture' or perhaps of a more or less ceremonious dissension in his mess upon the subject, persuade the medical officer of the ship to let him have a 'blood test.' To his [illegible] and consternation the result is returned as 'positive,' worse still [illegible] or even as the more dreaded (because unknown) positive [illegible] according to the pet nomenclature of the serologist. The victim then overcome by remorse or fear either volunteers for a course of N A B—he probably doesn't hold with galyl and has a proper Navy contempt for mercury—or else is discharged willingly to the nearest hospital for 'further treatment.' On admission, he is examined and found as far as physical examination goes to be free from disease. The ophthalmologist can find nothing, nunss the laboratory reports no abnormalities such as pleocytosis, abnormal globulin content &c. in the cerebro-spinal fluid and in fact nothing whatever is found except this damning positive 'blood test.'

Now from the *practical point of view* even if it did indicate the presence of living but latent spirochaeta in the patient's body, I maintain that no importance need be attached to such a result and no treatment need be instituted in such a case. It is the duty of a medical officer to do his best to keep men fit for service. This man is fit, his children are healthy, he is healthy himself. The result of the Wassermann reaction in his serum will not certainly be changed from positive to negative even by many courses of N A B and the patient will be caused more harm physically, mentally, morally and financially by repeated visits to the venereal wards of a hospital than by the hypothetical presence in his body of a dormant spirochaeta. Is it justifiable to subject such a man to the medical risks of intensive arsenical treatment or even to the inconvenience and pain of a prolonged course of mercurial injections? I think not and conclude that in similar cases we may tell the patient that his positive Wassermann reaction *makes no difference to him*. But this difficulty remains: if at times the Wassermann test indicates infection by living spirochaetes and at other times in other cases is simply an indication of a past infection, how is one to distinguish between them? Or in other words, of what value is the reaction as a control in treatment? The answer seems to be that the usefulness of the reaction in controlling treatment is very much less than in diagnosis for which it is indispensable. It is the clinical aspect of the case which is supremely important in deciding on the necessity for further treatment in a later record case. But the clinical examination must be made with infinite care and should include examinations of the organs of special senses of the blood and particularly of the cerebro-spinal fluid by men who are thoroughly competent to give an opinion on these special subjects.

The consideration of the practical value of a *negative* result is a far simpler matter, and opinions on the subject are much less divergent. One need only mention that within two months or so of the date of infection

the significance of a negative result is nil in order to point out that this fact is the foundation of the modern method of treating cases of venereal sores the specific nature of which is not proven, by a course of injection of arsenical compounds This method of treatment, which seems to me a very great advance has been adversely criticised in certain quarters on the grounds that it denotes incompetence on the part of the medical officer to diagnose the case and leads to carelessness in diagnosis Such criticism must emanate from supermen! Anyone who has been at all extensively engaged in venereal practice for any length of time must have encountered cases where the primary inoculation lesions have been either so small insignificant and atypical, or of characteristic chancroidal appearance and have not been found to yield spirochaetes on careful examination by dark black-ground illumination and other laboratory methods, which have been diagnosed as non specific and have returned later with secondary symptoms Such are the cases that are cured by the short intensive course of treatment officially recommended

The *practical value* of a negative test to a patient with a recent venereal sore is an assurance of speedy cure to a patient who has completed one or more courses of arsenical treatment for syphilis it is when performed at the proper intervals a practical guarantee of cure to a patient suffering from a skin eruption or other manifestations clinically resembling those of syphilis it is a sure indication at their non-specific nature Exceptions to these rules are extraordinarily rare and in point of fact the only one that need be specially mentioned is the fact that in certain diseases of the central nervous system of specific origin especially tabes dorsalis the Wassermann reaction in the blood may be negative while that in the cerebro spinal fluid which also shows the other signs of luetic infection is positive

With regard to the intermediate results the weak or very weak positives the doubtfuls the ± the negative hot positive [illegible] types one need say very little Obviously the more delicate the test is the more of these intermediate results will be obtained I am convinced that their practical value is very little They will occur in early cases which are passing from the sero negative to the sero positive stage of the disease and should appear in the reverse order as recovery takes place But in many instances they are produced by very minute divergencies in the laboratory technique and may also depend on slight variations in the sera of the guinea-pigs (complement) in the antigen and other ingredients of the test Especially are such results worthless when readings are made and returned by the serologist with no knowledge whatever of the clinical history of the patient

We have read perhaps about the 'tyranny of the Wassermann reaction But the test is no tyrant, nor is it a fetish, although among the men it seems to me it is in danger of becoming one In truth, it is a good servant but a bad master

CLIMATIC BUBO

By Surgeon Commander HORACE E. R. STEPHENS, O.B.E., M.B., B.S., D.P.H., R.N.

A DEFINITION of the term "Climatic Bubo" is rendered difficult owing to the fact that the qualifying epithet fails to represent its precise logical significance. Scheuhn coined the expression, applying it to a type of non-venereal adenitis not uncommon in the tropics (Manson). The object of this note is to offer a satisfactory explanation of this disease and to suggest the reason for its frequent occurrence.

One of the most striking phenomena which has come under my observation during a year in the Far East has been the great frequency with which acute and subacute lymphadenitis occurs in all regions of the body. Such a fact at once implies that the relation between *susceptibility* and *infection* has undergone some radical alteration to that which we are accustomed to accept as *normal*. Either the susceptibility is increased or the virulence of the infecting agent has become greater, or both.

It is proposed to discuss the etiology from an analysis of 177 cases of lymphadenitis, which were seen chiefly in civilian hospitals. The first three were shown to me by Surgeon Commander P. L. Crosbie, R.N., at the Royal Naval Sick Quarters, Wei Hai Wei, from that time forward each case was noted. Venereal examples are of course excluded.

During the hot moist weather the superficial layers of the skin, especially the *stratum corneum* and *stratum lucidum*, become softened and less adherent, a state which is intensified by the excessive amount of insensible perspiration which takes place. Examples of this loosened and soft epidermis are most frequently seen in the perineal region or between the webs of the toes. As a natural sequence following these changes in the physical characters of the superficial layers, the individual cells themselves are readily removed by friction, thus exposing the papillary bodies of the *corium*. Hence mild forms of dermatitis are very common, being referred to as chafes, intertrigo, or that word which covers such a multitude of ignorance, *eczema*. At any rate, it may be truthfully asserted in this connection, that it is the skin which bears the burden and heat of the day. Once this protective integument is damaged, its power of preventing micro-organisms reaching the lymphatic channels is very greatly diminished. In other words, the individual has become more susceptible to infection.

Out of the 177 cases it is acknowledged that forty-seven of them, or 26 per cent., cannot be classified in the category of "climatic bubo." Nevertheless, these numbers tend to direct attention to —

(1) The frequency with which lymphadenitis arises in all regions of the body in the tropics.

(2) The relative prevalence with which the inguinal and crural glands suffer.

The remaining [illegible] were a heterogeneous collection of non venereal buboes Many of them occurred at the same time which conferred on them a pseudo epidemic character Others were sporadic Some suppurated others resolved However the chief feature was that not a single instance came under my observation where the point of entrance of the micro organism through the skin could not be identified It is true that many of the original foci had healed the majority were minute, the skin lesion apparently trivial often lying hid in a wrinkle

Of the 116 cases of enlarged inflamed inguinal glands no useful purpose would be served in specifying the details of each lesion They largely comprised small foci of dermatitis in the perineal region or on the buttocks back, lower abdomen peri anal region or prepuce The actual lesions consisted of minute papules frequently sudamina vesicles becoming pustules, infected hair follicles pediculosis a solitary scabetic infection a septic tag of an external pile or a moist excoriated wart

In thirty five instances the crural glands were involved Most of these arose from infected mosquito bites on the legs or local patches of septic dermatitis on the inner side of the adductors produced by the friction of the trousers, small abrasions or commonly a septic condition between the webs of the toes popularly known as toe rot In two cases the primary site of infection was a mild onychia

Twelve cases of axillary adenitis were the sequel of infected mosquito bites, abrasions or onychia

In seven instances the superficial cervical group of lymphatic glands were implicated The deep group was also invaded in five of these During an epidemic of *sore throat* at Wei Hai-Wei during the autumn of 1921 acute cervical adenitis was the outstanding feature of the attack

Five cases occurred in which the pre auricular gland became inflamed All were due to a furuncle in the external auditory meatus

Solitary cases of inflamed occipital and mastoid glands came under observation Both were secondary to septic foci in the scalp following a seborrhoea

Whether the virulence of micro organisms is increased in the tropics or not is not the object of this note to prove It is merely put forward as a probability which rests on analogy There is no doubt that superficial wounds and abrasions suppurate with greater frequency in the tropics while venereal disease, in all its forms supplies an excellent example of increased virulence The appalling ravages of tuberculosis among the Chinese population might also be cited, although in this instance there are several other contributory factors. In the zymotic fevers the severity of the smallpox and scarlet fever attacks deserve notice

The use of the term climatic may appear justifiable in so far as the majority of cases occur during the hot moist weather On the other hand I would urge that such a loose and non-pathological expression deserves to be abolished We should then recognize that the protective

covering of the body has been penetrated, and search for the primary skin lesion Climatic bubo, *per se* does not exist when the true reason for the frequency of non venereal bubo in the tropics is realized The means of preventing its onset are therefore obvious

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THE CAMPAIGN AGAINST MOSQUITOES ON BOARD H M S *CADMUS* IN APRIL MAY AND JUNE 1912[1]

By Surgeon Commander D H C Given M D D P H R N

Hankow is considered to be one of the worst ports on the Yangtze for mosquitoes The country around is flat, and abounds in vast expanses of stagnant water which supply ideal conditions for their rapid development

Varieties of culex seem to predominate in the Foreign Concessions, but many types of anopheles are also seen Fortunately, there is comparatively little malaria among the foreign communities and the chief trouble caused by all the mosquitoes in general is insomnia from the irritation of their bites at night

It would appear, also that the itching and scratching which follows predisposes to prickly heat and septic skin conditions

During the short stay of the *Cadmus* at Hankow in the summer of 1911 swarms of mosquitoes found their way to the ship and caused considerable annoyance to everyone on board both officers and men , so bad were they that the captain considered it necessary to give permission to the ships company to sleep every afternoon to make up for arrears lost during the night

To prevent, if possible a recurrence of the trouble I commenced taking preventive measures early in April and whether as a result of those measures or not the numbers on board were greatly reduced and for over a month there were practically no complaints of their ravages from the ships company

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Since the publication of the article entitled Some Notes on Early Attempts at Prophylaxis against Coastal Fevers on the West African Station by Surgeon Lieutenant Commander Pedwick in the April number of the Journal in which the author describes a mosquito net for a hammock which they used on the coast it has come to our notice that a very similar type of mosquito net had been in use on H.M.S. *Cadmus* in 1912 (devised by the Medical Officer D H C Given) A report on this and other measures taken to combat mosquitoes in H M S *Cadmus* in 1912 was found in the Department of the Medical Director General and we understand that our predecessors had prepared it with a view to publication when the Journal of the Naval Medical Service first commenced publication, but it was not published Probably owing to the outbreak of war in 1914 it was overlooked Editors

I should mention [illegible] ashore the mosquitoes were not considered to be quite so numerous [illegible] as they were the year before

The precautions taken [illegible] (1) In cutting off, as far as possible the source which, after a time, was discovered to be chiefly the ship's sampans

(2) In attacking by every means that experience ashore and common sense could suggest, any mosquitoes that reached the ship

The Source —It took some time to discover that the ship's sampans were mainly responsible for the greater bulk of mosquitoes reaching the ship but after the cleansing out of the bilges of the sampans and the replacing of their matshed covers by light canvas awnings, which could be removed at sunset, the diminution of their numbers became very marked

Unfortunately it was found that the sampans were not the only source and some mosquitoes still continued to reach the ship

As the ship was always anchored over 300 yards from the shore the only explanation that suggested itself as to their source was that they were blown off from passing junks or sampans, or possibly from the shore

I should mention that before the sampans came under suspicion, all the scuttles and ports had been fitted with fine wire gauze netting in the hopes that the mosquitoes could be kept out of cabins and mess decks whether it was thought they were attracted by the light but the result of this procedure was absolutely nil as far as the mosquitoes were concerned in fact they became worse than ever, and the air supply to the lower [illegible] already very small, was seriously diminished

Measures taken to render the Mosquitoes harmless on board and to starve them out —This object has been more or less achieved by the use of citronella mosquito nets and a Japanese remedy in the form of joss sticks

Mosquito Nets —Although mosquito netting was supplied to almost every man in the ship's company scarcely one of them succeeded in making it mosquito proof net of it and nearly all of them were of the opinion that it was of no use and too wide in the mesh

The material was not at fault however the trouble was to fix it round [illegible] so as to make it mosquito proof

Two fairly satisfactory torpedo shaped nets were devised and their use demonstrated to the men so that any man who desired could have a similar one quickly made

The disadvantages of any mosquito nets for hammocks are —

(1) The mosquitoes become troublesome from about 8 p m before it is possible to use them

(2) That they require more time and trouble fixing up than the average man is prepared to take

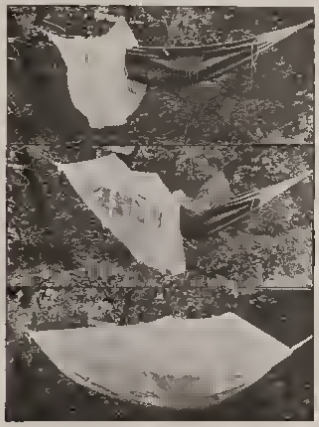
(3) On hot still nights they materially add to the man's discomfort in limiting the already small circulation of fresh air

(4) They are readily torn and rendered useless

[illegible] the Admiralty allowance of [illegible] mitting pattern was quite insufficient for me, then only one yard wide [illegible] this reason some of the men did not take up their portion and others returned it as useless.

Oil of Citronella.—This remedy had been in use on shipboard for many years and was very highly recommended. As mosquito nets did not prove entirely satisfactory I ordered a large quantity wholesale for use on board.

About half a drachm or less in the palm of the hand is sufficient to anoint the feet, ankles, hands and face, and to render them immune for at least four hours and in my experience for the whole night.



After using it on board [illegible] testimony of its efficacy.

Lieutenant Dalgleish, R.N., and I [illegible] use [illegible] and we were both agreed as to the [illegible] of citronella, any [illegible] which was neglected to use it we [illegible] trouble.

The Captain and other officers [illegible] mosquito [illegible] but they also had to use citronella as they found that a number of [illegible] invariably got inside their nets.

The majority of the ship's company who had thoroughly tried it also bore testimony to the same effect.

I used it on shore at the Military Sick Quarters where mosquitoes were very numerous. At my suggestion, for experimental purposes, the patients discarded their mosquito nets altogether and used only citronella and the results were equally satisfactory and convincing.

Again two of our cell prisoners while in detention on shore were severely bitten all over on their first night in cells. On the next and following nights after using citronella neither got bitten, although there were just as many mosquitoes as before.

Joss Sticks.—These had also been in use on shore for some time and were highly recommended. Three or four sticks were left smouldering under the table during dinner time and the smoke from them readily affected any mosquitoes that came under its influence.

The effect is to stupefy them so that they drop on the floor, whence they can be swept up in numbers afterwards and finished off. Even the smell of the fumes in a room is sufficient to drive mosquitoes out or keep them away. We used it in our ward room every night for some time with the result that very few mosquitoes were either felt or seen.

I supplied a quantity of these sticks for use on the mess decks also but the result there was not so unanimously vouched for. Their use in the aft deck and in officers' cabins was certainly very satisfactory.

REMARKS AT THE END OF THE COMMISSION IN OCTOBER 1912 AS THE RESULT OF FOUR MONTHS' FURTHER EXPERIENCE.

(1) The complaints about the ravages of the mosquitoes were practically nil as compared with the previous summer.

(2) We had not a single case of malaria during our ten months' sojourn up the Yangtse although a number of cases occurred on board other ships under similar conditions, and on board the *Pegasus* which relieved us.

(3) Longer experience proved more than ever the utility of citronella.

(4) One case of malaria was contracted at Hong Kong where the men slept on shore during our refit and our usual routine was somewhat upset. (The mosquitoes were not particularly numerous here.)

(5) While at Canton for the last fortnight of the commission there was another rush on the citronella as the mosquitoes there were particularly numerous.

In conclusion, I feel justified in making the following suggestions:—

(1) That the allowance of gauze netting to the ship's company should not be less than 3 yards by 2. A little more is probably advisable to allow for shrinkage in the wash. The present allowance of 2 yards by 1½ is quite inadequate.

(2) That citronella be supplied as part of the ship's stores to be dealt out to the ship's company when thought necessary. It is very cheap if

purchased wholesale, although [illegible] that ten pounds of it lasted [illegible] of the ship's company used it

I might add that the practical [illegible] be fully demonstrated owing to [illegible]

Not more than half a dozen [illegible] summer for this reason, but the [illegible]

Finally, as regards [illegible] throughout the summer and considered [illegible] be purchased locally at very small cost

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A BRIEF CONSIDERATION OF THE INTERPLAY OF A PRECISE KNOWLEDGE OF THE SIMPLER MENTAL PROCESSES IN HIGHER GUNNERY RATINGS AND WITH SPECIAL REFERENCE TO REACTION TIME AND PERCEPTION EFFICIENCY

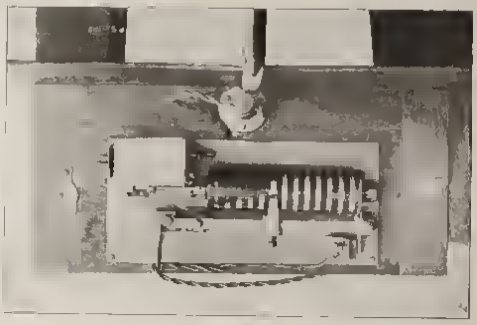
By Surgeon Commander W. A. Bolton, R.N.

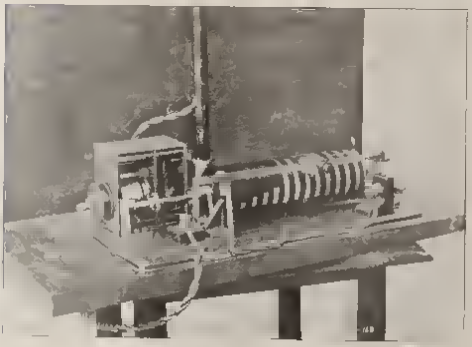
(*Continued from p. 190*)

Figs. 6 and 7 show in plan and elevation the detail of the [illegible] interval mechanism. A revolving drum is spun by a clockwork governor and regulated so as to give exactly six revolutions [illegible] one revolution in ten seconds. The drum is made up of [illegible] ebonite blocks each having inset a brass [illegible] so that the metal are manifest at the periphery [illegible] will vary in length proportionately. A sliding [illegible] (and illuminates the lamp) on my left hand brass strip [illegible] illumination may thus be varied to [illegible] fifth second [illegible] seconds. A reference to fig. 7 shows the brush set to give an [illegible] two seconds.

To explain a little further during illumination [illegible] one tenth of a revolution, 2 sec. one fifth revolution, 3 sec. three tenths revolution, one fifth sec. one fifth revolution and so on. The clockwork is regulated by a governor so that the speed of the drum [illegible] time recorder can be periodically checked. Afterglow is negligible [illegible] with the particular lamp used.

To prevent a second period of contact during revolution before the clock is stopped, a small tripping device is attached to the brush support and the proximal end of the drum as seen in figs. [illegible] shows a little brass arm set to contact on a tiny brass [illegible] shows

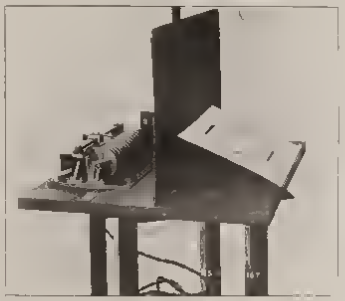




this arm off contact on to insulation after the catch has been released by the small peg on the drum end during its first revolution.

Test Cards.—Many different kinds of test material have been used from time to time on these cards, *e.g.*, groups of letters, nonsense words, letters mixed with figures, geometrical figures, &c. Most seem to have certain weak points, especially when the objective is a card that can be easily marked. Further, all cards in a test series should, whilst definitely differing from each other, be of precisely equivalent marking value.

After much deliberation I finally decided on the following device which to a large extent seems to meet the requirements defined. A certain element of guess-work must seemingly and unfortunately be constantly present and cannot be legislated for whatever the nature of the test used.



1

Commencing each card is [illegible] 8 cm. long, [illegible] its outer and 7½ [illegible] of facets is 4 cm.

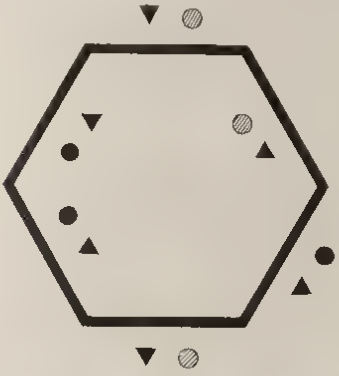
Set with reference to each [illegible] quadrilateral [illegible] each pin (see fig. 1) is disposed [illegible] to the free [illegible] centre and 1 cm. within or without [illegible] the case may be. The diameter of the circles and the [illegible] of the circles to each figure three are [illegible] the catch will be on one side of the [illegible] on the other. Fifteen different cards were made [illegible] groupings in all.

After trial it was decided to expose a different card to each subject

[illegible] 4 in [illegible] At the end of each test the subject was given a small blank lesson and asked to pencil in what he had seen. The nature of the test, marking &c., had, of course, been thoroughly explained beforehand.

Marks were given as follows:

(1) For positioning a △ and O on the correct side of their particular facet	1	1 × 6	6
(2) For positioning a pair △ and O correctly with reference to each other	3	3 × 4	12
(3) For giving the correct position of all colours	2		2
			20



[illegible]

[illegible] then multiplied by two to give the [illegible] correctly positioned [illegible] and [illegible] marks.

[illegible] they liked in [illegible] probably two [illegible] were usually sufficient to [illegible].

The [illegible] as to [illegible] of the test [illegible] were imposed and the [illegible] statistical [illegible] used as in [illegible] time series. As [illegible] suggested the subject [illegible] its in darkness to commence

[illegible] and after the [illegible]

[illegible] all [illegible]

In Table III [illegible] together [illegible] 30 and [illegible] and Mde [illegible] of illuminations [illegible] attention [illegible] The M [illegible] ately high [illegible] markings [illegible]

TABLE III.—[illegible] OF [illegible]

Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Whole 500—								
2 in.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
4	51.5	[illegible]	[illegible]	17.04	[illegible]			
8	55.02	[illegible]	[illegible]	[illegible]	[illegible]			
Under 30—								
2 in.	47.8	[illegible]	[illegible]	13.06	[illegible]	[illegible]	[illegible]	[illegible]
4	51.6	[illegible]	[illegible]	13.18	[illegible]			
8	55.0	[illegible]	[illegible]	13.0	21.18			
Over 30—								
2 in.	44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			

Table IV shows [illegible] as in the reaction times [illegible]

Further sub analyses [illegible] are under 30 and results [illegible] 11 per cent (fifty [illegible] be of any practical value [illegible]

The last group under the [illegible] asked were found [illegible] seconds after the test was [illegible] of the test card by the subject [illegible] considerable assistance to [illegible] an after image should be [illegible] groups do not show a great [illegible]

between [illegible] per cent and [illegible] per cent is the general tendency in [illegible] the Mental [illegible] show much the same range as in Table III.

It can hardly be expected that groups will reveal any considerable variation from each other. Such small tendencies to excess or sedentiness

TABLE IV.—SEX ANALYSIS OF WHOLE IRRESPECTIVE OF AGE

[illegible]	Age	Mid	Mdn	Mn	σ	Total	Per cent	Extremes
[illegible]	[illegible]	50	50	12.73	15.16	298	59.6	5—97.5
[illegible]	[illegible]	60	0	13.50	17.01			
[illegible]	[illegible]	50	55	13.62	16.31			
[illegible]								
[illegible]	15.11	15.60	40	15.9	19.47	97	19.4	7.5—92.5
[illegible]	[illegible]	60	50	12	15.36			
[illegible]	[illegible]	60	55	12.1	15.19			
[illegible]								
[illegible]	18.17	40	45	13.4	17.5	56	11.2	10—85
[illegible]	[illegible]	44	50	12.7	15.19			
[illegible]	[illegible]	6	55	10.5	12.66			
[illegible]								
[illegible]	18.1	Not determinable	15	11.3	17.52	12	3.1	20—90
[illegible]	[illegible]	Not determinable	50	11.3	16.38			
[illegible]	[illegible]	Not determinable	75	17.6	21.17			
[illegible]								
[illegible]	[illegible]	0	50	11.2	16.11	23	4.6	20—90
[illegible]	[illegible]	[illegible]	[illegible]	13.1	11.14			
[illegible]	[illegible]	[illegible]	75	11.3	17.7			
[illegible]								
[illegible]	[illegible]	50.60	12.5	11.2	13.11	11	2.8	25—85
[illegible]	[illegible]	31.15	15	13.1	16.63			
[illegible]	[illegible]	[illegible]	50	12.8	16.57			
[illegible]								
[illegible] (Groups)—				Grand total		500	100.0	
	57.1	0	0	11.5	17.11	31	6.2	90—92.5
	[illegible]	60	60	12.8	15.95			
	67.48	0	65	11.6	16.55			

[illegible] as may be present, will not, I think affect the average level and [illegible] especially when the potent factor of youth is considered. Again it has already been remarked that these groups have been sorted out largely [illegible] subjects own statements, personal observation, &c. and so I much [illegible] whether the average life lived by the great majority of ratings [illegible] sufficiently to much influence statistical results in "group" figures

FATIGUE

[illegible] in the problems of [illegible] efficiency that are [illegible] that [illegible] which correspond to the popular interpretation [illegible] in the pathological and the more technical [illegible] as "The sum of the results of activity which [illegible] diminished capacity for work"

It will be obvious that in specialized rating [illegible] in small extent that the factor of general fatigue need [illegible]

It will be as well then to enumerate certain points [illegible] tribute to this technical interpretation of the word [illegible] and that must be considered both in initial selection and [illegible] tion of efficiency (a) *Vocational selection* —It is [illegible] recognize is far as possible from the beginning that [illegible] aptitude and capacity for the particular work in any material [illegible] Close inspection of personal characteristics, real ambition along the selected lines of specialization, &c all must be considered in the first choice

(b) *Power of Concentration* —This may be only capable of improvement up to a certain point by training and its extent will largely depend on the quality of (a) and in the mental fitness of the individual along the general lines already indicated in this paper

(c) *Dexterity Rapidity of Observation and Immediate Memory* The desirability of efficiency in these directions is very obvious and I have endeavoured to indicate that such attributes are largely measurable and assessable by the methods described above

N B —Five minutes spent trying to gain practical insight into the duties of a T D L soon convinced me of the magnitude of the task and how very much depended on a consideration of every tiny detail and its efficiency And they gave me 'easy conditions—a roll and yaw and a 10,000 yards range Then somebody shouted down 100—shoot! 'down 400—shoot!' and my wrist began to ache as I chased it *trying* to chase my target with that horrible little horizontal line set in the focal plane of the telescope!

(d) *Failing Attention* —Sooner or later the power of attention must begin to wane and the goodness of results will progressively diminish The postponement of this will of course, depend much on the qualities of (a), (b) and (c) and to some extent, perhaps, on the degree in which the subconscious mind may legitimately be enlisted in performing a particular task.

(e) *Asthenopia* —Any contraption or protective conditions that may tend to defer eyestrain must greatly help in keeping back the onset of local fatigue A device known as Hanson's Diophthon was recently put forward by Surgeon Commander Reginald Hanson O B E, R N V R

Cp Second Annual Report of the Industrial Fatigue Research Board

(iii.) Substantially this instrument is simple [illegible] supplements at given periodical rest [illegible] the various of the usually unused [illegible] muscle. Digitalis has been tried but [illegible] certain of dignity [illegible] certainly its adoption in any series.

(*b*) *Duration of Work.*—The question [illegible] importance and should be legislated [illegible]

(*c*) *Freedom and necessities* usually [illegible] any [illegible] task and may arise a special [illegible] deficiency [illegible] extent then [illegible] the [illegible] fatigue under consideration [illegible] —

(*d*) *Pauses.*—Again it must be [illegible] fatigue with the [illegible] that tends to temporary [illegible] complete mental and physical relaxation [illegible] the mind in any individual. But this [illegible] that the whole question of [illegible] from a particular [illegible] serious thought as far as specialized ratings are concerned.

The following example of an experiment introduced into the [illegible] room of a boot factory is illustrative. Instead of the usual [illegible] employing two gangs each handling pieces teams of three girls working [illegible] operative working forty minutes out of the hour and resting [illegible] An increase in output immediately resulted ranging from 31 per [illegible] to [illegible] per cent and averaging 41·8 per cent over the six presses concerned.

CONCLUSION.

In conclusion I would emphasize that the various opinions expressed are not in nothing final but rather has it been my object to emphasize [illegible] space in my disposal the various principles involved. If this has been [illegible] shall be happy indeed that something has been accomplished [illegible] but the thin end of the wedge. We live in an age of intense [illegible] and with the progress it is surely a big truism to appreciate the [illegible] and realize that he is even more worthy of consideration [illegible] than are the products of his brains.

My thanks are again due to my wife for her patience in preparing fair copies of the various tables and to friends.

My thanks are also due to Captain P. H. Mitchell, D.S.O., R.N., Commander L. J. Holland, Commander B. A. Fraser and many others in *Excellent* who have been considerate in affording me every facility both in the making of the instruments here considered and in the collection of the 1,800 ratings tested in all. I am also greatly indebted to Surgeon Commander Murray P. Jones for his kindness and toleration in allowing me to use certain rooms in his sick quarters from time to time both whilst I was serving in *Excellent* and for some six months subsequently.

[1] See "Annual Report of the Medical Officer of Health, Bermondsey, 1913."

Naval Medical History of the War.

SURGICAL SECTION (*continued*)

[illegible] Surgeon-General A. ASHMORE WIDDY, C.B., K.H.P.

PART III.—REGIONAL SURGERY

[illegible] Fleet Surgeon [illegible] of the Midland [illegible]
[illegible] Fleet Surgeon [illegible] Surgeon [illegible] DUNCAN FRASER [illegible]
[illegible] Surgeon [illegible] Surgeon [illegible] Surgeon [illegible]
[illegible] M.B., R.N.

Applied Anatomy [illegible] By Fleet Surgeon [illegible] M.B., R.N.

[illegible] Surgeon [illegible] Surgeon [illegible] R.N.

(1)—(*a*) THE IMMEDIATE TREATMENT OF GUNSHOT WOUNDS OF THE ABDOMEN

By Temporary Surgeon-Lieutenant MAITLAND B. [illegible] R.N.

This experience of gunshot wounds of the abdomen was mostly gained while serving with the British Naval Armoured Car Squadron in Armenia, Persian Kommania, Russia and Galicia, and which was attached to the Russian army.

Our plan was to join up with an advanced Russian position, situated in a place from which the wounded cars had to work. This was about three miles from the front line trenches.

Our staff consisted of a surgeon, an anæsthetist, and two or three sick berth ratings. The work was done sometimes in dugouts, more often in tents, and once in a motor omnibus.

By arrangement with the Russian medical authorities the abdominal cases which came through that station were all sent to us. These Russian wounds were very different to the French wounds. Most of the fighting was open in character, and shell was used on both sides. The result that stretcher-bearers could visit all the wounded, and the wounded brought in within an hour of being wounded. The number of men killed was always large, and it was only possible to [illegible] on picked cases. The majority of injuries was from bullets.

These stations were really the only places where abdominal surgery was worth doing, for the next stage was twenty or thirty miles back, and transport was mostly by carts taking at least six hours to the primary over very rough tracks.

Our plan was to [illegible] except the [illegible] severe hemorrhage, to

but the patient [illegible] to recover [illegible] quite

Patients could [illegible] be washed and undressed [illegible] pulled up and then [illegible] down the skin was cleaned [illegible] and painted with iodine and the whole body [illegible] hot spirit over the skin men

Cases in which the intestine only was involved [illegible] were symptoms calling for interference

In those cases where there was both an entrance and [illegible] to track in [illegible] the incision was made [illegible] wound and if the track of the bullet could be traced [illegible] were not all pulled out but only those loops that [illegible] this plan both time and shock were saved and I [illegible] repent of not doing [illegible]

The intestinal wound [illegible] repaired with [illegible] portion of gut was excised if necessary making [illegible] with a single line of sutures

One noticeable feature about all Russian patients [illegible] no escape of fæces from the small or large intestine [illegible] black rye-bread and soup and this seemed to have [illegible] masses even in the small intestine This I am sure [illegible] all these cases I closed the abdomen without drainage In [illegible] cases where the bladder was perforated I sewed up the wounds [illegible] suprapubic drainage as there was no chance of these men having a catheter passed regularly owing to the scarcity of doctors and trained attendants

The patients would be kept at the station for twenty-four to seventy-two hours after their operation and then sent right back In the Dobrudja it was possible to send wounded by steamer and barge down the Danube for a distance of eighty miles and this was for the best form of transport

I came across three other patients two weeks after their operations all three were quite well One had had several inches of small gut excised many holes in the gut repaired and two wounds in his bladder closed Of the men I met on rejoining his unit a month later and I was informed that the majority had fine recoveries There is no doubt that abdominal work should be done as near the fighting as possible as all depends on the shortening of the period between the receipt of the wound and the operation

The immediate treatment should be the application of a first-aid dressing or far better a shell dressing a hypodermic injection of morphia and warmth to overcome the shock The patient should then be removed as soon as possible to a place where the operation can be done Sips of water do good food of course does nothing but harm At the station an examination is made, x rays being used if necessary and if obtainable, the patient should then be put in as quiet a place as possible to rest and get

[illegible] the shock. Warmth is the most important remedy. When [illegible] required the operation should be done as soon as possible.

Contra-indications to operation are (1) Non-recovery from [illegible] operation does not help these.

(2) Wound of the liver accompanied unless there is severe bleeding.

(3) The elapse of twenty-four hours since the receipt of the wound.

There are certain cases in which it is possible that only the abdominal wall is involved. If there is the least doubt the wound should be explored excising it at the same time. It is a good plan if the median incision has been made through the wound to lift up the walls as soon as the peritoneum has been opened to see if the wound has perforated the [illegible]. I have found no wound of the peritoneum in cases where I had every [illegible] to expect a perforation.

The abdominal cavity may only just be opened and [illegible] prolapsing. In these cases the wound should be excised [illegible] and returned and the wall of the abdomen sutured. On [illegible] knuckle of gut may be bruised grooved or perforated. In these [illegible] only necessary to treat this piece of gut no general examination [illegible] be made.

Foreign bodies should always be looked for and removed [illegible] always lead to septic trouble.

Intravenous saline should be used for hæmorrhage [illegible] the operation should follow at once.

Technique of Operations.

The patient should be warmly clothed with thick [illegible] the legs. A heated operation table is better than a [illegible].

It is best to treat any wounds of the head first as trauma [illegible] after an abdominal operation causes much shock.

Incision.—This should be planned to deal with the particular [illegible] shown by the direction of the missile or by x-rays. Often a [illegible] felt under the skin and this will give the line. If there is no [illegible] the direction a paramedian incision of good length [illegible].

Transverse incisions for the upper abdominal wound [illegible] for spleen liver and kidney cases. They give better [illegible] more easily than vertical ones. For wounds in the [illegible] involve the peritoneal cavity it is often best to open the abdomen [illegible] and explore.

The wounds should be closed layer by layer [illegible] sutures of silkworm gut in figures of eight through all [illegible] peritoneal cavity in my cases was mopped out and [illegible] drain was used in cases where there was much [illegible]. [illegible] no indication to confine the operation to one [illegible] time.

After the abdomen has been opened the blood is sponged out bleeding vessels are picked up and tied and the ileocæcal valve found From this point the whole length of the small intestine and its mesentery is run through the hand and examined wounds are clamped off and repaired later The large intestine is then examined and the necessary repairs made At this time one has a fairly accurate idea of the course the bullet has taken and the organs likely to have been injured are examined The intestines must be kept well covered with hot packs to prevent shock

Wounds of the Stomach—A paramedian incision is generally the best, but in some abdomino-thoracic injuries the thoracic route is best The pleural wall may be involved without the anterior and if there is any doubt this must be explored through the gastro colic omentum Gastrectomy may be necessary, if the duodenum or pylorus is much damaged

Wounds of the Intestines—These should be sutured with thread or silk in the transverse line or if they are quite small with a purse-string suture The possibility of resection is much higher than of suturing so resection should be kept for very badly damaged gut or wounds of the mesentery with impaired blood supply Omental grafts greatly add to the safety of the repair Colostomy is often the best treatment in rectal injuries

Wounds of the Bladder—These should be repaired with two layers of catgut for the muscular layer, and silk for the peritoneum Urine should be drained off by a separate suprapubic drainage tube

Wounds of the Liver—These should be closed by deep sutures or packed with gauze Wounds of the gall bladder and ducts are repaired and a cigarette drain put down to the spot

Wounds of the Spleen—These can generally be treated by suture or packing Splenectomy is at times necessary to excise the spleen

Wounds of the Kidney—Packing or suture with a drain through the loin meets most cases Nephrectomy is needed if there is much damage or if the blood supply is effected

Abdomino Thoracic Wounds—In some of these cases there is a hernia of some abdominal viscera through a rent in the diaphragm the most common seems to be the omentum and next to this the spleen, stomach and colon These hernia are all on the left side The hernia may not take place at once but follow in a few days

TREATMENT

Every means possible must be taken to get a knowledge of the route the projectile has taken If wounds of the hollow viscera of the abdomen can be ruled out there is then no need to open the abdomen in most cases A transpleural route enables the rent in the diaphragm to be repaired more easily, and the lung can be treated at the same time

If there is a hollow viscus perforated this must be treated first by an

[illegible] necessary it has been shown that [illegible] the frequent cause of death Waller [illegible] —

[illegible] that the diaphragm is the ideal tissue [illegible] complement for its accomplishment [illegible] in many cases to involve a large [illegible] applied to the wounded man

It would [illegible] reasonable to enhance the [illegible] recommendation —

(1) That [illegible] wounds may be disregarded

(2) That [illegible] wounds in [illegible] blowing wounds are respected [illegible] of the lung [illegible] the lung combined [illegible] that attempt [illegible] should not be used to treat the [illegible] lesion [illegible]

(3) In other [illegible] explanation should [illegible] lung and diaphragm [illegible] intended to interrupt adhesions

— —

IV. THE IMMEDIATE TREATMENT OF GUNSHOT WOUNDS OF THE THORAX

In the immediate [illegible] wounds of the thorax [illegible] probably [illegible] lung [illegible] to [illegible] All [illegible] done for the lung [illegible] the mortality [illegible] the mortality [illegible]

After [illegible] the parts of the lung [illegible] applied [illegible] the thorax and lungs [illegible] The mortality [illegible] in those cases that [illegible] septic the post-mortem [illegible]

The [illegible] pneumothorax has been exploded there is no hibernation [illegible] the blood [illegible] great [illegible] The lung can be handled and sutured without hard [illegible]

The [illegible] summarized [illegible] Surgeons should [illegible] the [illegible] and exterior [illegible] and hemothorax [illegible] the diaphragm and [illegible] the heart [illegible] of bone The [illegible] as well

INDICATIONS FOR OPERATION

(1) All [illegible] the chest wall [illegible] small and [illegible] should be excised and sutured

(2) All wounds of the lung caused by [illegible] should be excised and sutured

(3) All [illegible] pleural cavity except [illegible] small pieces should be [illegible]

(4) All wounds of the lung complicated by compound fracture of the ribs should be explored and fragments of bone removed, and the [illegible] excised and drained

(5) A large hæmothorax which cannot be aspirated should be opened and drained out the lung expanded and the chest wall closed

CONTRAINDICATIONS

(1) Great shock and collapse

(2) Small clean wounds and no serious symptoms

(3) Collapse of opposite lung

Bullet Thorax Wounds.—In those cases in which there is a bullet through the lung the chest condition should be dealt with first and the bullet removed from the pleural side In other cases in which the bullet through the lung is small the abdominal condition should be dealt first if some hollow viscus has been perforated

GENERAL TREATMENT

A wounded patient should first be put to bed and kept absolutely [illegible] until the shock is passed off The patient breathes easier in a [illegible] position Morphia with atropine takes off the restlessness

There are two exceptions to this rule —

(1) Serious progressive hæmorrhage

(2) The presence of a large wound opening the thorax, and causing difficulty of breathing by the suction action of the chest wall

In the first case the external wound should be excised and hæmorrhage from an intercostal artery stopped If the lung is damaged the complete operation afterwards described should be performed In the second case the complete operation should be performed at once if the patient's condition permits of this but if for some reason this is not possible either the skin should be sutured across the wound to obtain an air tight joint or one of the rubber bags used by Major Morelli should be inserted into the wound and blown up with air The complete operation can then be performed when circumstances permit

All operative treatment on the chest should be done as soon as possible as the great object is to prevent sepsis after thirty hours it is not much use attempting this method of treatment

Hæmothorax.—The bleeding in cases of hæmothorax that do not die at once is either from an intercostal artery or, which is far more common from a wound in the lung Hæmorrhage of the lung usually stops as the lung collapses but in some cases it will continue spasmodically for days

The cause of this is probably that a clot which is closing a blood vessel is sucked out by the movements of the chest wall there being a negative pressure in the pleural cavity at the time It is in these cases

that artificial pneumothorax is so valuable. The [illegible] should be aspirated and at the same time air should be injected [illegible] a positive pressure.

Authorities do not agree about the use of artificial pneumothorax following immediately on operation. While some [illegible] aspiration so as to make the lung expand at once, others [illegible] the pneumothorax of a positive artificial pneumothorax to keep the wound [illegible]. It seems to me the treatment should depend on the condition of the lung at the operation. If the lung wound is small and it is possible to make a good air tight repair then aspiration is best so as to make the lung expand at once; but if the wound is a large ragged one and a good repair is not possible then a negative pressure would be harmful.

Technique of Operations.

The wound of the soft parts of the chest wall should be [illegible] completely any fragments of a rib or a foreign body removed the edges of the rib trimmed up and if no more is needed the wound sutured. But if there is a large hole in the chest wall or if the lung has been wounded, or if there is a foreign body in the lung the operation [illegible] carried further.

If, by enlarging the present wound it is possible to extract the foreign body and repair the lung 4 in. of the rib should be removed but if it is impossible to use the original wound a new incision should be made. As a rule the best site for this is over the fifth or sixth rib in the mid axillary line.

The wound having been opened out after excision of part of the rib any blood clot is scooped out so that a good view of the lung can be obtained. The pleural cavity is then explored with the hand for foreign bodies pieces of bone and these are removed. The lung can then be drawn up into the wound and examined lung forceps being used for this purpose. Foreign bodies can then be removed either through the wound in the lung or through a fresh incision. The wound in the lung should then be explored for bits of clothing &c., and if possible completely excised and sutured. If it is impossible to excise the wound it should be [illegible] up as much as possible and then sutured.

Suturing of the lung is best done in two layers deep and superficial the superficial layer being put in like a purse-string stitch turning in the edges of the pleura.

The pleural cavity should then be cleaned out by irrigation [illegible] and finally dried. The chest wall should then be closed in layers as in abdominal work.

Aspiration is often needed for the first few days to keep the cavity dry and the fluid should be replaced by air unless [illegible] of the lung had been possible.

If fluid is allowed to stay in the cavity it severs half an inch [illegible]

[illegible] AND BONE SURGERY

[illegible] *Hospital* [illegible]
[illegible] CHAMBERS [illegible]

[illegible]

[illegible] which after the [illegible] the experience of [illegible] branch of surgery [illegible] has [illegible] controversy and [illegible] the present time [illegible] is the best [illegible] and tedious [illegible]

[illegible] in [illegible] and [illegible] opinions in the [illegible] Chatham Hospital [illegible] Alfred St Wm in Chatham [illegible] writing [illegible] opinions of other [illegible] experience [illegible] treatment &

[illegible] instance [illegible] the Royal Naval [illegible] when [illegible] were admitted [illegible] the Zealand [illegible] April 2 1918 when [illegible]

[illegible] the advantages of the purely aseptic [illegible] physiological school the difficulties of obtaining [illegible] especially when dealing with a large number [illegible]

A [illegible] on the various antiseptics—carbolic acid [illegible] hydrogen peroxide boracic powder [illegible] proflavine the hypochlorite solutions, and the bismuth [illegible] recommended by Professor Rutherford Morison [illegible]

The [illegible] to except tincture of iodine for skin [illegible] of carbolic acid and hydrargyri perchlor

recommended by Lord Lister [illegible] I have [illegible] cleaning prior to operating with [illegible]

Much was hoped for from the [illegible] flavine that it has a powerful [illegible] more powerful in the presence of [illegible] that it does not interfere with [illegible] germicidal action is very high [illegible] antiseptic and owing to its [illegible] and intraperitoneally I have [illegible] abscesses in a strength of 1 1000 [illegible]

Sir Watson Cheyne used it [illegible] employing, at the same time [illegible] results

Bipp —Excellent results have [illegible] iodoform paraffin paste introduced [illegible] recent wounds in which suppuration [illegible] can be performed which leads [illegible] dressings In long injuries and [illegible] gives very satisfactory results [illegible] be strictly adhered to For sloughing [illegible] should be employed the wound being [illegible] methylated spirit The paste consisting of two parts iodoform [illegible] bismuth subnitrate with sufficient liquid paraffin to make a [illegible] then smeared over the wound with a piece of gauze In [illegible] especially in compound fractures the ends of the bones are well [illegible] No excess of paste should be left—the wound is then sewn up

There is as a rule some reaction after this method of treatment [illegible] rise of temperature &c but the dangers of Bipp poisoning are [illegible] and practically *nil* when employed properly I have seen [illegible] cases a blue line develop in the gums but after frequent [illegible] seen the severe gastric symptoms which have been described [illegible] were undoubtedly due to the improper use of the very [illegible] introducing the paste in too large quantities—

The Carrel-Dakin Treatment —This treatment by irrigation [illegible] with a solution of sodium hypochlorite [illegible] attempt with handbook results and is of special [illegible] is a treatment especially indicated in cases where [illegible] it shortens the process of healing prevents septic [illegible] wounds to be closed by secondary suture at an early date

The technique of using Dakin's solution is [illegible] is hardly necessary to go into details [illegible] the method [illegible] solution is conveyed to the wound by small [illegible] tubes perforated at short intervals by very small holes and [illegible] end by a ligature These small tubes are attached to a glass [illegible] apparatus which is connected by a rubber tube with a [illegible]

[illegible] the seventy [illegible] of the [illegible] [illegible] irrigation is [illegible] [illegible] is packed [illegible] the Bipp treatment [illegible] wounds to [illegible] [illegible] summary [illegible] from the [illegible] [illegible] bacteriological report [illegible] [illegible] closed by [illegible] suture

[illegible] discussion [illegible] [illegible] to discuss the treatment of compound [illegible] which they [illegible] admitted [illegible] preliminary treatment and [illegible] [illegible] with presence of slough [illegible] cases with [illegible]

[illegible] sterilization is necessary [illegible] hypochlorite method of instillation [illegible] with bone injury frequent [illegible] for the removal of sloughs [illegible] When the wound becomes more [illegible] and when the bacteriological [illegible] will be employed In most cases [illegible] can be made, and in these [illegible] of mattress sutures over rubber [illegible] the Bipp treatment is also to be [illegible] when sepsis is present, the Carrel-[illegible] results

[illegible] visiting the Newcastle Hospital and seeing [illegible] Professor Rutherford Morison, where the 'Bipp' [illegible] employed even in cases of profound sepsis and [illegible] I have no doubt that the Bipp [illegible] in the first instance would in the majority of [illegible]

In [illegible] and fracture admitted to hospital, where [illegible] persist there is no doubt that Bier's passive hyperæmia [illegible] great efficacy I believe in these chronic cases that [illegible] hyperæmia treatment should be given and subsequently [illegible] the skin and removal of sequestra performed The [illegible] treated with Bipp and closed

Many cases of [illegible] were treated The wound treatment in these [illegible] be briefly summarized Free drainage is to be [illegible] — [illegible] of wound track—removal of detached bone fragments [illegible] drainage a necessity

In these [illegible] and this [illegible] these fractures [illegible]

Gunshot Injuries of the Elbow Joint.—[illegible] ment is a result [illegible] disability. In the [illegible] living and accordingly ankylosis in good position [illegible] designed.

The varieties of wounds of shoulder and elbow joints [illegible] classified as follows:—

(1) Penetrating wounds without fracture.

(2) Penetrating wounds complicated with sepsis.

(3) Fracture of bones entering into joint with [illegible]

In gunshot injury of these joints where [illegible] the bones entering into the joint and [illegible] excision of the joint with the object of [illegible] opinion the best procedure to adopt.

In the case of the shoulder joint [illegible] drainage established and Carrel Dakin irrigation [illegible] course being left open. The arm must be kept in [illegible] position.

In the elbow joint here excision is also [illegible] bone removed depending upon the amount of [illegible] arm must be kept in position of flexion and supination [illegible] is very necessary in these cases, and the rather [illegible] on these joints the better will be the results. In all [illegible] and elbow the forearm should be kept in position [illegible] of hand towards the face.

In injuries of the shoulder abduction [illegible] the wrist dorsiflexion is the correct position during treatment.

Having discussed briefly the question of [illegible] in warfare, I might allude to the cases of compound fracture [illegible] life. In these cases which as a rule [illegible] aseptic methods undoubtedly give the best results.

Routine Methods which in my Opinion are the Best to Use.

The whole area is thoroughly washed with water and [illegible] cutaneous perforation is enlarged sufficiently [illegible] ments and the wound is irrigated freely with [illegible] cleansing must be done very thoroughly especially between and [illegible] the fragments, and the peritoneum as high [illegible] best to leave the wound open lightly packed with [illegible] Reduce the fracture and immobilize the limb in splints [illegible] an opening over the wound.

Where there is much comminution of bone and [illegible]

[illegible] pt those who [illegible]

[illegible] a dramatic [illegible] necessary

[illegible]

[illegible]

[illegible] *Dairy* [illegible] treatment [illegible]

[illegible]

[illegible] most [illegible] necessary [illegible] congestion [illegible] limited

[illegible] sion is followed by Bier's [illegible] ment. There are two methods of applying this treatment [illegible] we can [illegible] applied above the lesion [illegible] and below [illegible]

[illegible] must be employed.

[illegible] plating neoplasm [illegible] All these methods have their advocates but [illegible] day the method of [illegible] transplantation [illegible] and most satisfactory results [illegible] theories are advanced [illegible] with [illegible] I need not go into this [illegible] lom's advice the patient [illegible] guilt and the guilt should [illegible]

In the performance [illegible] gical success and a patient [illegible] parkit immobilization [illegible] triumph at the operation [illegible]

[illegible]

[illegible]

[illegible]

THE MEANS [illegible] WHICH [illegible]

All methods aim at the [illegible]

(1) To prevent shortening and [illegible]

(2) To allow of early [illegible]

No [illegible] to say [illegible] can be employed [illegible] partially employed in the [illegible] in my opinion in the [illegible]

Fractures of Lower Limb. [illegible] the upper below the trochanter [illegible] Robert Jones describes as [illegible] method extension is [illegible] counter extension by means [illegible] pelvis. The dislocation from [illegible] other fractures of the femur [illegible] the use of the Thomas splint [illegible] and counter extension [illegible] employing the weight of the [illegible] the tube of the splint and the skin [illegible] axis pull with the limb in the position [illegible] splint weight [illegible]

In fractures [illegible] Thomas splint [illegible] by adhesive strapping [illegible] was found very [illegible] fractures recommended by Sayre were [illegible] success and relief [illegible]

The Hodgen splint [illegible] upper third of femur [illegible] tures of the shaft of the femur [illegible]

night and that the splint [illegible] completed with the [illegible] apparatus, the patient sent to [illegible].

Injuries of the Knee—The Thomas splint is used in hyperextension at the knee [illegible] of slight flexion (not more than 10°) is preferred.

Fractures of Tibia and Fibula and through Ankle Joint—The skeleton foot splint as used by Sir Robert Jones is most useful in these fractures.

When both bones are broken, and there is overriding of the fragments extension must be applied. This can be easily done when the fracture is situated in upper half by means of Thomas splint but when fracture is present near or into ankle joint and a wound is present, extension becomes more difficult. This difficulty can, however be overcome by a fenestrated plaster dressing reinforced by an iron band forming a loop from which extension can be made, a method advocated by Mayer.

The calliper method advocated by Hey Groves and others is also most useful in these fractures for procuring extension.

Fractures of Upper Limb—Fractures through shoulder joint and surgical neck of humerus. In severe cases with suppuration, &c., and where ankylosis may be expected the arm is to be kept in the abducted position (50°). As I mentioned before, incision is best performed in these severe cases.

Minor injuries in this neighbourhood can be treated by a pad in axilla and bandaging of upper arm to side. The abduction splint of Sir Robert Jones is very useful and very satisfactory in these shoulder cases.

Fractures of shaft of humerus. The modified Thomas humerus extension splint is the best method of dealing with these fractures, or a modified Thomas knee splint maintaining the limb extended in the abducted position can be employed. Both of these splints are extremely useful in war fractures of humerus as they permit of easy dressing of the wound.

Injuries of the Elbow—The importance of excision is alluded to before. When ankylosis is aimed at, position is one of much importance the proper position being flexion (about 70°) and supination.

Fractures of the Forearm—It is very important in these fractures to maintain a position of supination. In gunshot wounds of wrist it is also of extreme importance to maintain the hand in hyperextension, which is easily done by means of Sir Robert Jones hyperextension hand splint.

Conclusion.

There is no doubt that from the experience gained in the war a great advance has been made in this particular branch of surgery. Further advances and improved methods of treatment will be made in the course of time.

In this brief article I have attempted from the experiences I have had whilst treating a large number of cases at the Royal Naval Hospital

Chatham, and from a study of the writings and methods of others to record what I consider to be the best procedure to adopt in these cases.

I am indebted to Surgeon Rear Admiral W. G. Axford, C.B., and to Surgeon Captain M. L. B. Reid, O.B.E., for giving me their experience in dealing with these bone cases.

(m) AMPUTATIONS AND ORTHOPAEDIC SURGERY

By Temporary Surgeon Lieutenant A. C. McAllister, R.N.

PART I

THE THEORY OF AMPUTATION

By the courtesy of the editor of the JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE much of the subject matter below has been reproduced from an article on the same subject which appeared in the January 1919 number of that Journal.

In pre-war days 500 amputations would probably be the maximum number performed in Great Britain in any one year. During the war that number and sometimes more were performed weekly. Such an experience had its natural result: the views formerly held concerning amputations were profoundly modified. In the light of war experience and as a result of active co-operation between the orthopaedic surgeons and the limb makers the classical amputations in vogue in pre-war days have for the most part been modified and in some cases ruled out of court altogether. Few would now be considered perfect from the limb-wearing point of view. Experience gained during the war will be of great service to the limbless of the future.

In civil practice in peace time amputations are performed to remove crushed, diseased or otherwise useless limbs and the operation is generally final and curative, but during the war the primary amputation was often only the beginning of a long illness, the possibility of the advent of sepsis making it necessary for the first operation to be merely a conservative measure and the patient had to submit to re-amputation and often to frequent re-amputation before his stump could be considered perfect or useful. During the first year of war re-amputation was necessary in 40 per cent. of cases, but later with improved methods that figure was reduced to about 6½ per cent.

In the Royal Navy amputations have been performed to remove wounded or injured limbs and in a few cases for disease such as sarcoma of the long bones. The number of amputations performed has fortunately been comparatively small and forms a low percentage of the total number of killed or wounded. There are two reasons for this fact. A shell exploding on board ship explodes in a confined space and the occupants of

[illegible] settled [illegible] hours [illegible] and the [illegible] in the hot [illegible] stagnation [illegible] and last [illegible] station [illegible] with the [illegible] leading to [illegible] imputation [illegible] event of sepsis.

[illegible]—Amputations.

It [illegible] well [illegible] to bind [illegible] essential [illegible] stump [illegible]

[illegible] with [illegible] use and [illegible] with [illegible] and [illegible] tissues [illegible] there is great disadvantage [illegible] the end of the stump. Missile [illegible] may be a hindrance. [illegible] the end of the bone is to [illegible] stump there is [illegible] the action of the flexor muscles [illegible] unnecessary bleeding [illegible] of the limb and the skin will [illegible] advantage [illegible] what must be avoided [illegible] freely movable [illegible]

The skin should [illegible] a deep furrow [illegible] healed painless [illegible] the position [illegible] the stump. The tissues [illegible] entirely free from [illegible] contain no painful [illegible] and [illegible] minimum [illegible] prove the disease [illegible] increased [illegible] The joints above [illegible] may [illegible] of the above [illegible] operations which [illegible] may be obtained by the exercise of [illegible]

There are a few details in the [illegible] deserve special mention here. [illegible] only to [illegible] amputations and [illegible] conservative operations follow [illegible] considered later.

The Writing of Flaps.—[illegible] amputations by the circular method [illegible] and the scar is generally over the [illegible] from any available skin and subcutaneous [illegible] to have the scar either behind or to [illegible] this means making a marginal [illegible] arise where the scar may possibly be [illegible] the inner or outer aspects of the limb and the [illegible] preference to surrounding [illegible] flaps. The flaps should be so [illegible] to lie between them and the bone [illegible] length of flap results in a [illegible]

Section of the Muscles, &c.—After the [illegible] have been dissected up the muscle should be cut [illegible] level half an inch below the plane where the bone is to be [illegible] incision severing the muscles should also cut through the [illegible] right round the bone. The periosteum should then be [illegible] dissector. After the bone has been sawn through this [illegible] should be sewn over the sawn end. The importance of this [illegible] overestimated, for the cuff of periosteum thus formed [illegible] of bony spurs which are nearly always painful. It is not [illegible] employed in septic cases.

Ligature of Vessels.—Every vessel seen should be tied [illegible] Silk should never be used under any circumstances, [illegible] all ligatures not being absorbed for a great length of time [illegible] the cause of sinuses forming in the scar before or when the [illegible] be worn and these sinuses will not heal until the offending [illegible] away or is removed. The writer has removed many [illegible] ligatures from such sinuses, but never one of catgut. [illegible] troublesome still in septic cases.

Division of Nerves and Tendons.—These should be drawn [illegible] as possible and each cut off with one stroke of the knife.

Suture of the Flaps.—After having seen that the flaps [illegible] accurately, a few tension stitches of silkworm gut should be inserted [illegible] the skin and deep tissues and then the skin margins should be [illegible] approximated by fine catgut or horsehair. Just as much care should be taken over this step as is taken in the suturing of an incision in the [illegible] Pains taken in this direction will be richly repaid when the time comes for an artificial limb to be worn; only then can the value of a scar from an accurately sutured wound be appreciated.

AMPUTATIONS [illegible]

Stumps of the lower [illegible] into three classes according to their capabilities [illegible] the weight of the body

(1) *End-bearing Stumps*—[illegible] capable of bearing the whole weight of the body on the end of the stump; examples are the Syme and the disarticulation at the knee joint

(2) *Lateral-bearing Stumps*—Here the weight is taken by the bony prominences above and also by the soft tissues of the upper part of the stump In some thigh stumps the weight is taken chiefly by the tuber ischii and in some leg amputations by the tubercle and tuberosity of the tibia

(3) *Partial Fail-bearing Stumps*—In these there is a combination of [illegible] and (2) The amount of weight borne at the end of the stump is [illegible] by some being taken by the bony prominences above and the soft [illegible] around Examples are supra condylar amputations of the thigh and [illegible] through the middle third of the leg

(4) *Amputations of the Toes*—The great toe is the only one which calls for any special mention In removing this toe the chief difficulty is to [illegible] whether to remove the head of the first metatarsal or not If it is [illegible] the results are sometimes not altogether satisfactory as the patient [illegible] of the natural springiness of his gait whereas if the head of the [illegible] shaft it is rare to have sufficient skin to cover it properly In this [illegible] the flap becomes stretched and the skin forming it eventually becomes [illegible] and finally ulcerates as a result of direct pressure of the boot [illegible] amputation and at that almost complete removal of [illegible] metatarsal bone in order to have good sound skin in the flaps [illegible] toes a plantar flap should always be employed except when [illegible] disarticulated from their corresponding metatarsal bones when [illegible] flap have to be employed Should all the toes have to be removed [illegible] the heads of the metatarsal bones should always be [illegible] otherwise a good plantar flap cannot be obtained One toe only [illegible] be left as it always becomes deformed and renders the fitting [illegible] difficult

(5) *The Foot*—Many amputations have been devised for this region, but there are only two which have any practical value Syme's amputation, and any procedure which will leave a fair portion of the metatarsals behind to afford a good lever in front of the ankle joint but this unfortunately is merely possible Therefore in wounds or injuries to the fore part of the foot, the question to be debated is whether to do Lisfranc's amputation at the tarso metatarsal joints, or Chopart's amputation at the mid tarsal joint or the Syme Chopart's or Lisfranc's amputations may be done as an experiment and should they fail to give a good functional result, as they almost invariably do they should be converted into a Syme Any other operation at or the ankle joint should never be done. Lisfranc's and Chopart's amputations fail to give a good result for several reasons Firstly, even

when it is a good plantar tread there is as much of the foot behind the ankle joint as there is in front of it and consequently there is very little movement at that joint and the patient walks with a "stump gait." Secondly deformity of the stump is extremely likely to occur owing to contraction of the tendo Achillis and the stump assumes a position of extreme equinovarus. The patient then walks on the end of his stump causing endless trouble and the fitting of a satisfactory boot is impossible. Tenotomy is almost useless as a remedy and the stump must be converted into a Syme. There are several other amputations through the tarsus but these are undesirable. They include the subastragaloid disarticulations of Pirogoff and Lisfranc and Nélaton and those amputations done with the intent of leaving a portion of the os calcis to become united to the sawn end of the tibia, such as Pirogoff's. These are all difficult operations and done with the intention of improving upon the Syme. In this they fail. It is claimed for them that they give a good weight bearing stump and that which is longer than the Syme but whereas the Syme is *occasionally* too long these others are *always* too long and on this account it is difficult to fit a satisfactory artificial boot with movable ankle within a reasonable to the boot of the opposite side. Besides this the distal end beneath the astragalus leaves this bone to wobble about at the end of the stump and in Pirogoff's even supposing the piece of os calcis [illegible] to the tibia—and this is by no means the rule—it quite commonly [illegible] loose again and by virtue of its mobility causes the patient endless trouble and often severe pain by pressure upon the internal plantar nerve.

The Syme Amputation.—The fact that a man can walk with a Syme as well as well and nearly as fast with his artificial feet as he could with his natural feet gives support to the statement that the Syme is the best amputation in the region of the ankle which is worth considering. There were many of these cases after the Gallipoli landing chiefly as a consequence of frostbite of the toes. All the results were good. The Syme amputation however has one or two defects. Chief of these is that the end of the stump is too large. It must be remembered that the astragalus [illegible] to make the artificial ankle are situated on either side of the end of the stump, and if the end of the stump is too diamstick like it follows that the ankle has not such a neat appearance as would be the case with a stump which would allow the side stays to be placed a little closer together. Other defects lie in the fact that the flap may become too loose or become displaced to one or other side or worse still backwards. The prevention of these defects arising may be attained by doing what may be termed an *extended Syme*. This differs from the classical operation mainly in two particulars, (1) the position of the incision for the heel flap and (2) the position for sawing the bones. In the classical operation the incision is made with only a slight inclination backwards and this results in the bulky flap so commonly seen. But if the incision is inclined backwards so that when it crosses the sole of the foot it is about three-quarters of an inch from

the tip of the [illegible] stump will be [illegible] The incision should be [illegible] the tip of the [illegible] to a point half an inch [illegible] The upper ends of this incision are joined by [illegible] the level of the ankle joint and should open that joint.

The fibula should then be [illegible] and the [illegible] dissected out of the leg flap by keeping the [illegible] much easier to do than to write the flap should be [illegible] the classical Syme [illegible] which [illegible] the surface of the [illegible] and of the [illegible] hold the lower end of the bone and any projecting [illegible] The stump given by the extended operation is a little longer and more bulky than [illegible] the classical operation and as a result it is much better from an [illegible] point of view and what is more important still, it allows the

[illegible] the extended Syme amputation. The dotted lines represent the incisions [illegible] extended operation the other lines show the classical operation

[illegible] to be adjusted absolutely at the proper level thus doing [illegible] the probable necessity of a high heel on the sound side. The [illegible] obtained when the end of the stump clears the ground by [illegible] inches.

(To be continued.)

NAVAL MEDICAL MEMORIALS

UNVEILING CEREMONY AT HASLAR

The [illegible] three memorial tablets in commemoration of the Naval Medical Officers and Nursing Staff who were killed during the Naval Service during the war was unveiled on August 17th 1922 in the Royal Naval Hospital Haslar by Sir Robert Hill K C B K C M G Director Medical Department of the Navy

The unveiling took place in the presence of a large assembly which included relatives and friends of those whose names are recorded on the Memorial the Medical Officers of the Fleet with their families Surgeon Rear Admiral W Bett C B M V O with the Medical and Nursing Staff of the Hospital and members of the V A D all the naval sisters present were in uniform

The ceremony commenced at 4 p m with a short and impressive service conducted by the Chaplain of the Hospital the Rev C [illegible] O B E M A

On the conclusion of this part of the service, Surgeon Rear Admiral Bett in a brief address referred to the importance of the occasion and how much it meant to them all concluding by remarking how pleased they were that the official head of their department was able to be present to perform the ceremony

Sir Robert Hill standing close to the White Ensign which covered the Memorial first acknowledged the honour he felt in being called upon to perform the unveiling ceremony On the Memorial he said were inscribed the names of the naval medical officers of the permanent Service including sisters of the Queen Alexandra's Royal Naval Nursing Service medical officers of the Royal Naval Volunteer Reserve those members of the medical profession who threw up their practices and appointments and joined the Navy as temporary surgeons nurses from civil employment who joined the Queen Alexandra's Royal Naval Nursing Reserve medical students who were still pursuing their studies when they joined the Service as surgeon probationers and members of the Voluntary Aid Detachment

To those already in the Service the war came as a tremendous fulfilment of their expectations and long years of training and preparation were put to the test For their colleagues in civil life from the most eminent physicians and surgeons downwards in all those who surrendered their practices in war was a terrible disaster Their desire to do their best and give their services were most needful involved throwing up their practices and leaving their homes in a state of uncertainty which must have caused them acute anxiety Nevertheless they joined up with us and helped us through to the end

As with the doctors so with the nurses They were commemorating

[illegible] sacrifice [illegible] to be unveiled [illegible] about to be placed in the Naval Hospitals at Plymouth and Chatham.

Sir Robert said he could not conceive a more suitable site for the Memorial than the gateway of Haslar Hospital which was built in the eighteenth century and was in itself a memorial to the most glorious deeds in naval history. To Haslar Hospital were brought eventually the sick and wounded from the battles of Copenhagen, St. Vincent, the Nile, Trafalgar, the Crimea and the Baltic, and during the Great War its wards were filled to overflowing. Haslar for many years was the home of the old Greenwich Pensioners who since then had been otherwise provided for. Through the gateway of Haslar Hospital passed every surgeon and nursing sister on entering the Naval Medical Service and future generations in passing would pay their tribute to the sacrifices of those brother officers and nursing sisters who gave their all for their King and Country and who would remain for ever an example in patriotism.

Sir Robert then released the flag and the memorial was unveiled.

After the unveiling a surpliced choir led the singing of the hymn "For all the saints who from their labours rest," the music being played by the Commander-in-Chief's band. After this the blessing was pronounced by the Chaplain and the ceremony concluded with the singing of the National Anthem.

A laurel wreath from the Sick Berth Staff was afterwards laid at the foot of the memorial.

The memorial, which was greatly admired, has been carried out by Messrs. G. Maile and Son, Ltd., of London. It is of solid bronze with design and lettering in bold relief and measures 5 ft. 5 in. by 1 ft. 7 in. Simple and dignified in design the tablet has been allotted a prominent position to the right of the entrance porchway facing the main gates of the Hospital and is an enduring tribute to and a permanent record of those whose names it bears.

In the January number of the Journal we hope to reproduce a full page photograph of the memorial and intend publishing accounts of the unveiling ceremonies at Plymouth and Chatham. The date for the Plymouth ceremony has been fixed for Wednesday, October 4th, at 3 p.m. but for the Chatham unveiling had not been arranged at the time of going to press.

HISTORICAL NOTE

HISTORICAL NOTE: HOSPITAL SHIP VICTUALLING IN THE EIGHTEENTH CENTURY. *ROPHID* [illegible] 1780 [illegible] 44. *PUBLIC RECORD OFFICE*

(CONTRIBUTED BY PHYSICAL LIEUTENANT [illegible])

[illegible] the eighteenth century the officers and men of the [illegible] crews of hospital ships were given a definite initial [illegible] the purser with Admiralty approval received one eighth of [illegible] all such as his emolument. For the sick and [illegible] a contract was made between the Victualling Commissioners [illegible] victual them at so much a head irrespective of sickness [illegible] these victualled quarterly and receiving payment [illegible] Commissioners for Sick and Wounded became the best [illegible] of the Victualling Commissioners.

The *Nightingale*, a vessel of 352 tons was bought [illegible] Hall at Rochester in 1776 for £4 44. She carried [illegible] twenty four guns until 1781. In 17[illegible] she appears [illegible] 1779 is still shown as such. In 1782 she was [illegible] Harwich. On occasion between 1770 and 1780 [illegible] receiving ship for prisoners. It should be [illegible] stationed in each of the home ports and [illegible]

[illegible] the above circumstances and other evidence [illegible] from which the rate at which sick were kept [illegible] unfortunately there no date [illegible]

METHOD OF VICTUALLING SICK MEN ON BOARD HOSPITAL SHIPS

PATIENTS ON LOW DIET	To have one pint [illegible] or Family [illegible] of [illegible] pint of Milk [illegible] drink Tea and Water [illegible] other other liquors [illegible] by the Surgeon. Other Wine [illegible] Tamarind Water [illegible] Water [illegible] These drinks [illegible] Surgeon may [illegible] choice of [illegible] for the respective patients.
THOSE ON HALF DIET	To have for breakfast one pint and [illegible] for dinner eight ounces of boiled Mutton [illegible] discretion of the Surgeon. One pint of Bread light bread pudding (eight ounces of green [illegible] Bread with three pints of small beer.

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[1] Panada is a dish made by boiling [illegible] taste with sugar, nutmeg or other [illegible] —O.E.D.

[2] Ptisan, a drink made from pearl barley. —O.E.D.

PATIENTS [illegible]

[illegible] Breakfast [illegible] as upon half [illegible] [illegible] ounces of bread [illegible] of roth sixteen [illegible] ounces of [illegible] quarts of [illegible] [illegible] honey or [illegible] in the [illegible] That three [illegible] of an ounce [illegible] pint of milk shall be allowed to a [illegible] and half an [illegible] [illegible] quantity of [illegible] porridge

Nurses entrusted in the [illegible] of full diet [illegible] and [illegible] Surgeon shall [illegible] [illegible] and [illegible] in the [illegible]

And as Bailey-nate [illegible] thanks for the sick the [illegible] when directed by the Surgeon [illegible] mentioned [illegible] [illegible] the Nurses [illegible] cause the Bed and Bed [illegible] and hindrances [illegible] shall be necessary

Also Beds and Bed [illegible] of the Patients [illegible] and [illegible] neither patients put into their and [illegible] of wholesome

For which the Nurse [illegible] per man a day for every sick Seaman or Marine [illegible] likewise the same for every nurse

The Navy Board pay wages to the Nurses

Clinical and Practical Notes

A JAPANESE DIVING APPLIANCE

By [illegible] Lieutenant Commander C. D. MACINTOSH, M.B., R.N.

While at Thursday Island recently several officers of H.M.S. *Fantome* were invited to witness a demonstration of a new diving appliance the invention of a Japanese named Okushi.

Thursday Island being the headquarters of one of the largest pearl fisheries in the world, everything connected with diving is of very real interest to the majority of the inhabitants, and practically all the people attended the divers' sheds where were exhibited the appliance.

As it would appear to revolutionise many of our ideas on diving in general, it occurred to me that a short description of the appliance might be of interest to naval medical officers, especially to those who have enjoyed the doubtful privilege of a trip to the bottom of Portsmouth harbour in the ordinary service dress, with in some cases the added and still more doubtful pleasure of being blown up between the bilge keels of the diving tender.

The apparatus is simplicity itself, consisting merely of a metal, rubber-padded

[illegible] the diver's face [illegible] the [illegible] the [illegible] the

THE SIGMA FLOCCULATION FOR SYPHILIS: REPORT ON 1,[illegible] CASES COMPARED WITH THE WASSERMANN REACTION

By Surgeon Commander H. St. C. [illegible], M.B., R.N.

Dreyer and Ward in the Department of Pathology, Oxford University have described a flocculation test to which they have given the name of the Sigma (Σ) reaction. This test has been evolved from a number of flocculation tests commenced by Hermann and Perutz and of these tests the Sachs-Georgi has yielded the best diagnostic results compared with the Wassermann reaction.

Sachs and Georgi used an unstable heart extract, difficult to standardize, but recently Bordet and Ruelens have prepared a stable and sensitive heart extract antigen that can be standardized.

This antigen is used by Dreyer and Ward in the Sigma reaction.

Technique.

The technique has been described very fully by Dreyer and Ward (*Lancet*, May 7, 1921) in their original article, and is briefly as follows:—

The antigen is that of Bordet and Ruelens and is an acetone-free alcohol alcoholic extract of calves' heart and is given a factor showing its particular sensitiveness. 1 per cent. solution of cholesterin is added to this and the cholesterinized antigen is carefully diluted by a special dropping apparatus to give a standard opacity.

Dilutions of inactivated serum 1 in 1·25, 1 in 2·5, 1 in 5·2, 1 in 13·1, 1 in 26·4, 1 in 46, 1 in 92, 1 in 232 and 1 in 462 are added to the antigen in Dreyer's tubes by the drop method and incubated at 37° C. for seven hours. The results are then read. The amount of flocculation varies from a complete sedimentation of large flocculi leaving a clear upper fluid to a very fine flocculation only visible with a lens. The amount of flocculation has different values, which multiplied by the dilution and the antigen factor, gives a figure in standard flocculation units or (Σ) units.

Sera containing less than one (Σ) unit with no definite history of syphilis are considered to give a negative reaction; sera containing four or more units give a positive reaction; and sera containing one to four units should be repeated and considered. Sera with a definite history of syphilis containing over one unit are considered to give a positive reaction.

A cerebrospinal fluid containing less than one unit is considered negative, and one containing one unit positive.

Difficulties of the Technique.—The technique of the Sigma reaction is generally simple and accurate; the chief difficulties are:—

(1) Standardization, the size of the drop which can be overcome by using the drop pipette during the whole operation, carefully cleaning it after each stage.

(2) The standard flocculation is judged by the eye and a very slight increase or decrease of the size of the flocculi would be difficult to detect.

(3) Sepsis.—If a negative serum becomes infected it may give a positive reaction; the risk of sepsis is increased by the incubation for seven hours at 37° C. So a obviously infected should be discarded.

The (Σ) reaction performed in this laboratory is identical with that of Dreyer and Ward except that the dilutions of serum were only put up in five tubes of dilutions of 1 in 1·25, 1 in 2·5, 1 in 5·2, 1 in 13·1 and 1 in 26·4. Unfortunately I had never seen Dreyer and Ward's standard flocculation and therefore have to rely on what I imagine to approximate to, so that the results obtained were used as a qualitative than a quantitative reaction.

Control sera of each case were sent to R.N. College, Greenwich, for Wassermann reaction. These were previously inactivated at 55° C. for five minutes.

COMPARISON BETWEEN THE SIGMA AND WASSERMANN REACTION

The cases were from private practice only cases for diagnosis some cases of known syphilis and some recently treated cases

Total Number of cases 125

Cases with Wassermann + (Σ)		19
Cases with Wassermann − (Σ)		103
Cases with Wassermann + (Σ) −		2
Cases with Wassermann (Σ) +		1

Wassermann results of doubtful positive have been taken as positive

Of the two cases Wassermann + Sigma −

(1) G H F, H M S *Midas* admitted with apoplexy, no history of a sore but had a urethral discharge years ago which may have been a urethral chancre No history of secondary syphilis

The Wassermann reaction and (Σ) reaction were compared on three separate occasions and the results on each occasion were the same

(2) P F H M S *Cambrian* History of contracting syphilis in 1918 no details of sore or secondary symptoms Sigma reaction February 21 1922 Negative Wassermann reaction very weak positive

Previous Wassermann reactions were	January 7,	1920	Very slight positive
	May 27,	1921	Negative
	November 9	1921	Negative

Of the one case Wassermann − Sigma +

H A B H M S *Cambrian* admitted with sore on penis no secondary symptoms Sigma reaction gave a strong positive The case was treated with N A B and one month later the serum gave a doubtful positive Wassermann reaction

Of these 125 cases the number agreeing with the Wassermann reaction was 120 = 97 6 per cent

The advantages of the Sigma reaction over the Wassermann reaction are briefly —

(1) The technique of the Sigma reaction is simpler

(2) The Wassermann reaction would be extremely difficult to standardize as the antigen amboceptor complement and red cells vary at different times The Sigma reaction is standardized

(3) The Sigma reaction can be carried out in places such as this hospital in Bermuda where there are no sheep and the Wassermann reaction consequently cannot be performed

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THREE INTERESTING CASES

By Surgeon Commander J R MUIR M B R N

Double Perforation of Gastric Ulcers

D H aged 36 Chief Stoker H M S *Tusgard* The patient was admitted to the Surgical Medical Section at Haslar on May 2 1922, with a diagnosis of gastric ulcer

[illegible]

[illegible] through th[illegible] trouble[illegible] twist a[illegible] after th[illegible] phe[illegible] time a[illegible] rarer [illegible]

[illegible]

[illegible] The [illegible] down [illegible] The [illegible] packed [illegible]

[illegible] the operation [illegible] of the [illegible]

Patient [illegible] 30th [illegible] next morning, and [illegible] fluid including high [illegible] but without [illegible] about 84 to 104 whilst the [illegible] belly [illegible] only the [illegible] was rejected [illegible] the terminal [illegible]

At noon [illegible] assisted by [illegible] Rodd [illegible] opened in the middle line below the [illegible] of enormous [illegible] all tissue covered with flakes of lymph [illegible] fully protruded [illegible] present [illegible] as far as could be seen and [illegible] found in the pouch of Douglas. All the fluid and [illegible] as it is possible to dry swabs. A drained [illegible] the upper end of the wound [illegible] purse-string suture passed [illegible] the [illegible] The [illegible] the small intestine [illegible] allowed [illegible] to thrust so this spirit [illegible] Paul [illegible] the position. A fresh purse-string suture was applied [illegible] the Paul's [illegible] the intestine was moved to the pubal [illegible] pelvis was [illegible] through the lower end of the [illegible] the [illegible] as possible. Patient [illegible]

At [illegible] the patient had slept all the afternoon [illegible] noon was moved [illegible] the fluid [illegible] good night and slept right [illegible] the [illegible] faeces [illegible] the Paul's tube [illegible] 30th. On the 31st [illegible] Thanks to [illegible] efficient [illegible] on the part of the [illegible] the [illegible] the [illegible] mental [illegible] though occasionally [illegible] of [illegible] and [illegible] the diaphragm [illegible] proved. Occasionally very small [illegible] [illegible]

On May 30 as the [illegible] the [illegible] in good condition I proceeded to [illegible] the [illegible] Assisted by Surgeon Captain R. H. the sensation [illegible] the protruding loop [illegible] the [illegible] opened. The [illegible] was stitched [illegible] below the [illegible] and [illegible] adhesions which [illegible] the [illegible] Th[illegible] in [illegible] of the [illegible] away [illegible] the [illegible] closed by a Connell's suture [illegible] the lumen of [illegible] being little if any diminished. The abdominal [illegible] the wound closed without [illegible]

Except for a severe attack of [illegible] the 31st [illegible] faeces passing [illegible] portion of the [illegible] history was uneventful. Vomiting on June 2 brought away [illegible] faeces and on the following day [illegible] normally [illegible] going, thereafter with [illegible] the exception of a small stitch [illegible]

Drainage of the small intestine for its paralytic [illegible] surgical procedure but [illegible] until facculent vomiting has [illegible] the prospects of success [illegible] diminished. Promptness in recognizing the condition and [illegible] success. This case would [illegible] to show that ileus paralytic [illegible] of most of its [illegible] and that [illegible] patients need not be [illegible] topless condition.

t

[illegible] PERFORATED GASTRIC [illegible] SIMULATING APPENDICITIS

[illegible] R [illegible] aged corpl R M V [illegible] This patient was placed on the sick [illegible] May 6 collapse [illegible] pain in the abdomen and on the [illegible] to Hasler [illegible] history of obstruction of several [illegible] On admission the [illegible] pain with tenderness and rigidity all [illegible] the abdomen but much more [illegible] the right iliac fossa Temperature [illegible] 72 Patient looked [illegible] after observing for a short period he [illegible] upon at 10 30 p m the provisional diagnosis being an acute [illegible]

[illegible] a little doubt in my mind the abdomen was opened by a para [illegible] incision and a large quantity of pus was found in the right [illegible] apparently due to the appendix The appendix was long kinked and [illegible] down in the retrocecal fossa and it was not until it had been [illegible] difficulty and examined that it was possible to say that it was [illegible] of the abscess formation although it was inflamed and contained [illegible] The [illegible] was extended upwards a little, and a perforated ulcer [illegible] the upper and posterior part of the pylorus This was closed with [illegible] reinforced by Lembert's sutures A split tube with gauze [illegible] the site of the ulcer and the abdominal wound closed with [illegible] sutures

[illegible] after thirty six hours and patient made a good recovery [illegible] was retarded by an attack of phlebitis in the left femoral [illegible]

[illegible] simulating an acute appendix even after opening the [illegible] Throughout all the discharges from the ulcer had run down [illegible] there was no effect on all the kidney pouches or any [illegible]

Reviews.

[illegible] By Professor Leo V Zumbusch, Munich London John [illegible] and Danielsson, Ltd 1922 With 63 illustrations taken direct [illegible] by colour photography and one single colour illustration [illegible]

[illegible] represents a new departure in medical illustration Of its sixty [illegible] sixty three are examples of colour photography by a method [illegible] The pictures which are taken direct from patients, are [illegible] probably superadde anything hitherto achieved in accuracy of [illegible]

[illegible] primarily for students and general practitioners, rare and [illegible] have not been included

[illegible] described and explained in a short and concise letterpress [illegible] Snowman

[illegible] of the cinematograph in recent years has helped to demon [illegible] of illustration for instructional purposes and the publishers [illegible] the desirability of using the atlas in conjunction with a textbook [illegible] venereal diseases

[illegible] illustrated by the atlas is the great advance that has taken [illegible] of syphilis in the last ten to fifteen years Some of the

[illegible] mainly con[illegible] sion—
[illegible]

[illegible] the atlas and s[illegible] interest and [illegible] [illegible]

A[illegible] for the atlas is to purposes [illegible] A selection of its [illegible] should be displayed in all V D offi[illegible] lessons demonstrating [illegible] what may be expected if treatment [illegible] Further [illegible] public must receive instruction [illegible] is to be [illegible] appreciated, it must be accompanied by [illegible] (either in [illegible] photographs) such as this atlas places [illegible]

D H G

PHYSICAL [illegible] CHEST By James Crocker M D M R C P L, D P H [illegible] Tuberculosis Glasgow University Medical School [illegible] Fellow [illegible] Northern Scotland London H K Lewis and Co Ltd [illegible] 251 with 56 illustrations including 11 plates Price [illegible]

In this [illegible] deals generally with his subject but has also [illegible] special reference to pulmonary tuberculosis and includes a chapter on [illegible] the larynx subjects with which he is specially qualified to deal [illegible] This primarily intended for the use of students it will be found [illegible] useful to the general practitioner more especially to revive his knowledge of the anatomy of the thorax and to obtain the modern aspects of x rays in [illegible] The plates illustrating this latter method are excellent and the text in this particular chapter are a real aid to interpreting the results of the operator's work

The chapter on Tuberculosis of the Larynx is well illustrated and as the author states in his preface no examination of the chest is complete without one of the larynx especially in cases of pulmonary tuberculosis We therefore recommend this book to our readers

THE TUBERCULOSIS CLINIC By Several Writers Edited by Noel D Birdswell M V O M D F R C P Consultant Physician King Edward VII Sanatorium Midhurst London John Bale Sons and Danielsson Ltd 1922 Pp v + 111 Price 6s net

This book is a handy volume consisting of eight chapters each being written by different authors well qualified to do so in the various branches of work met with in a tuberculosis clinic In the past the work of such a clinic is only to be found haphazard in various textbooks and journals The Editor has been successful in collecting the various details into one book in a most readable and interesting form To those of our readers who are interested in one of the most important subjects of preventive medicine we thoroughly recommend the possession of this book and it will be found specially useful to candidates for a diploma in public health

DE ARTE PHISICALI ET DE CHIRURGIA MAGISTRI JOHAN ARDERNE, Surgeon of Newark dated 1412 Translated by Sir D Arcy Power K B E, M B Oxon F R C S from a Transcript made by Eric Millar M A Oxon from the Replica of the Stockholm Manuscript in the Wellcome Historical Medical Museum With coloured frontispiece and 13 plates London John Bale Sons and Danielsson Ltd 1922 Pp xii + 60 Price 10s 6d net

This is the first of a series of volumes describing the objects manuscripts and other documents in the Wellcome Historical Medical Museum which Mr Henry S Wellcome intends to publish from time to time

[illegible]

[illegible]

[illegible]

[illegible] ... clear type ... [illegible] ... are [illegible] ... used. The [illegible] ... General [illegible] ... this work to our [illegible] ... every [illegible] giving them all the [illegible] likely to [illegible]

[illegible] A Compendium of the [illegible] with Practical [illegible] M.B.L. [illegible] Price 10s. [illegible]

[illegible] to many [illegible] and Chemicals [illegible] complete. [illegible] Handbook

J. W. H.

◆

News of the Service.

OBITUARY

[illegible] Surgeon Commander James [illegible] Wallis, M.D. [illegible] July 19, 1902 [illegible]

[illegible] January 1900 [illegible] Tropical Medicine [illegible] Public Health [illegible] Naval Health [illegible] Naval Medical Service [illegible]

[illegible] Rear Admiral George [illegible] was recollected [illegible] as a colleague and [illegible] Naval Medical Service in 1897. [illegible] magnificent [illegible]

[illegible]

HONOURS AWARDED

[illegible] on the occasion of His M[illegible] Uniform Order —

[illegible] R N

[illegible] the following pro[illegible]

[illegible] W[illegible] Newport M V [illegible]

[illegible] W[illegible] R N [illegible]

[illegible] by Has M[illegible]

[illegible] Officer in recognition [illegible]

[illegible] S S A

[illegible] R N

[illegible] Major [illegible]

[illegible] W[illegible] Newport [illegible] R

PROMOTIONS

[illegible] T Jeans C M G M B [illegible]

[illegible] S Burniston C M G M B [illegible]

DEGREES AND DIPLOMAS

[illegible] under A F Mal[illegible] M B B A succ[illegible] June 1[illegible]

[illegible] Diploma [illegible] passed the examination of the Medical [illegible] Psychological Medicine

THE ROYAL SOCIETY OF MEDICINE

WAR SECTION

[illegible] the War Section (Lieut-Colonel General Sir J[illegible] Goolwin [illegible] M[illegible] [illegible] of the Army Medical Service) is d[illegible] [illegible] section more p[illegible]

[illegible] afford a [illegible]

ROYAL NAVAL MEDICAL COMPASSIONATE FUND

At the Quarterly Meeting of the Directors of the Fund held [illegible] 19[illegible] one [illegible] medical aid £20 was voted to the applicant. The fund was given to the [illegible] widow of a chemist aged 40 of a dispatch in the Royal Navy [illegible] who was finally unable to continue as a compassionate case but could [illegible] equally entitled to the case of her aged mother who has no means to support her. [illegible] assistance towards living expenses. Voted £20.

Medical Officers of the Active List of the Royal Navy who [illegible] invited to do so are [illegible] consequence. Subscriptions should be sent to the Honorary Secretary Naval Medical Compassionate Fund Medical Department of the Navy Admiralty S.W.1.

ADMIRALTY ORDERS ISSUED FROM JUNE 15 1922, TO AUGUST 15, 1922

(Only the more important Orders pertaining directly to the duties of the Medical [illegible] of a general and confidential nature included.)

1612.—Retired Pay—Surgeon Commanders R.N.

(C.W. 57112/22. 10.6.1922.)

The retired pay of Surgeon Commander R.N. of 24th July 1917 and certain [illegible] of the Surgeon Commanders listed on 1st July 1919 who are found to be epileptic [illegible] letter issued [illegible] the regulations will not in any case be reduced below £[illegible] 10 [illegible] the [illegible] certain regulations [illegible] order [illegible] retired pay which may be made in future consequent [illegible] of living.

(M.O. 2458/22.)

1749.—Sick Berth Ratings—Non-substantive Titles

(N.1C242/1. 30.6.1922.)

[illegible] will be given for the following official non-substantive titles at consul [illegible] Sick Berth [illegible]

[illegible] Operating Room Assistant
[illegible] Laboratory Assistant
[illegible] X-Ray Assistant

Notices.

[illegible] Officers to [illegible] Papers [illegible] personal experience [illegible] the Naval Medical [illegible] welcome [illegible] home and for [illegible]

[illegible] published [illegible] will become the property of the [illegible] the author [illegible] copyright [illegible]

[illegible] Deaths [illegible]

[illegible] the Editor [illegible] Royal Naval Medical [illegible] Medical Department, Admiralty [illegible]

[illegible] Naval Medical [illegible]

[illegible] Manager [illegible] Medical Department [illegible] to which all communications relating to subscriptions [illegible] addressed

[illegible]
[illegible] W.C.

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[illegible]